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November 29, 2017

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Karen Kirchner
Superfund Division
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

Dear Ms. Kirchner:

Subject: Final Soil Gas and Vapor Intrusion Investigation Technical Memorandum

Southeast Rockford Groundwater Contamination Superfund Site

WA No. 200-TATA-05DK, Contract No. EP-S5-06-01

CH2M HILL, Inc. (CH2M) is pleased to submit the final Soil Gas and Vapor Intrusion Investigation Technical Memorandum for the Southeast Rockford Groundwater Contamination Superfund Site in Rockford, Winnebago County, Illinois. This document has also been provided to Brian Conrath (Illinois EPA) as indicated below. If you have any questions, please contact me at 414-847-0264.

Sincerely,

CH2M HILL, Inc.

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Crystal Reuss Project Manager

Enclosure: Final Soil Gas and Vapor Intrusion Investigation Technical Memorandum, Southeast Rockford

Groundwater Contamination Superfund Site (1 hard copy and 2 CDs [1CD is redacted])

c: Brian Conrath, Illinois EPA (1 hard copy and 1 CD)

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TECHNICAL MEMORANDUM



Soil Gas and Vapor Intrusion Investigations Southeast Rockford Groundwater Contamination Superfund Site WA No 200-TATA-05DK/Contract No. EP S5-06-01

PREPARED FOR: U.S. Environmental Protection Agency (EPA)

PREPARED BY: CH2M HILL, Inc. (CH2M)

DATE: November 29, 2017

Introduction

This technical memorandum documents the activities associated with the 2016 and 2017 soil gas and vapor intrusion investigations conducted at the Southeast Rockford Groundwater Contamination Superfund Site (site). The purpose of the soil gas investigation was to continue the evaluation of site contaminants in soil gas to identify the potential for vapor intrusion impacts to properties within the investigation area. The purpose of the vapor intrusion investigations was to determine if the vapor intrusion pathway is complete and significant (that is, causing indoor air concentrations to exceed regulatory target levels) at properties identified in the 2014/2015 and 2016 soil gas investigations. The investigations were conducted for EPA under Work Assignment No. 200-TATA-05DK, Contract No. EP S5-06-01.

The Fourth Five-Year Review Report for the site (EPA 2013) identified the need for evaluation of potential indoor vapor intrusion risks for people living or working above the groundwater contamination plume and recommended deep soil gas sampling. Soil gas investigations were completed in 2014 and 2015 by CH2M. Based on the 2014 and 2015 investigation findings, it was concluded that additional investigation of the potential for vapor intrusion was necessary in three areas where site-specific volatile organic compounds (VOCs) were measured in soil gas above EPA vapor intrusion screening levels (VISLs) (CH2M 2016a).

In 2016, a soil gas investigation was performed at one of the three areas identified for additional investigation based on the 2014 and 2015 investigation results. Two rounds of exterior soil gas sampling were performed at 9 permanent exterior soil gas probes in this area. Concentrations of one or more site-specific VOCs were detected above EPA VISLs at three of the nine soil gas probes. Based on the 2016 investigation results, four residential properties were identified for interior vapor intrusion sampling, but only two granted access. Two rounds of interior vapor intrusion sampling (subslab soil gas, and/or indoor, outdoor air) were performed at these two properties, one in February and one in June 2017.

Vapor intrusion investigations were conducted in 2016 at the other two areas identified for additional investigation based on the 2014 and 2015 investigation results. Two rounds of interior vapor intrusion sampling (subslab soil gas, and/or indoor, outdoor, and/or crawlspace air) were performed at one property in each of the two areas (one commercial [Property 5]¹ and one residential [Property 6]²), one in August and one in December 2016.

¹ Property 5 was previously identified as the commercial property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

² Property 6 was previously identified as the residential property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

Additionally, per EPA request, in June 2017, a third round of interior vapor intrusion sampling was performed at the residential property (Property 6²) previously sampled in 2016. This property was located directly across from one of the contaminant sources at the site (Source Area 4). Following the August 2016 soil gas investigation, remedial actions began by Illinois EPA (IEPA) at the source area to clean the soil and pull impacted soil gas back towards the source area. The June 2017 samples were collected following completion of this remedial action to evaluate its effectiveness. Electrical Resistance Heating process was applied to the source area soils in Area 4 from November 2016 through February 2017. The remedial activities at Source Area 4 are anticipated to be documented in a Remedial Action Completion Report that will be submitted to EPA by IEPA (Kirchner 2017).

The following field documentation items are attached to this memorandum:

- Attachment 1—Photographic Log
- Attachment 2—Soil Boring Logs
- Attachment 3—Soil Gas Probe Construction Logs
- Attachment 4—Soil Gas Sampling Forms
- Attachment 5—Building Survey Forms
- Attachment 6— Subslab Soil Gas, and Indoor, Crawlspace, and Outdoor Air Sample Forms
- Attachment 7—Waste Characterization Results and Disposal Documentation
- Attachment 8—Data Quality Evaluation Memorandums

Site Description and History

The site is located in the City of Rockford, Winnebago County, Illinois, and consists of an approximately 7.5-square-mile area (Figure 1). The overall site is defined in the June 2002 Record of Decision as the area where groundwater contamination exceeds 10 parts per billion of total chlorinated VOCs (EPA 2002). Benzene, ethylbenzene, toluene, and xylenes are also identified in the Record of Decision as groundwater contaminants of concern. Much of the groundwater plume underlies an area of mixed residential and commercial properties extending from Sandy Hollow Road to North 23rd Avenue and from Alpine Road west to the Rock River (Figure 1). There are four primary source areas within the site: Area 4, Area 7, Area 9/10, and Area 11. A description of each source area and a summary of investigations/remediation activities previously conducted in each source area are presented in the *Uniform Federal Policy Quality Assurance Project Plan* (UFP-QAPP) (CH2M 2014).

Previous Vapor Intrusion Investigations

Historical Soil Gas Surveys

Soil gas surveys were conducted by Camp, Dresser & McKee (CDM) during Phase I and Phase II site investigations between 1991 and 1993, and additional soil gas sampling was conducted in 1996 within Areas 4, 7, 9/10, and 11. Residential indoor air sampling was conducted during the remedial investigation in Areas 4 and 7, and additional indoor air sampling was conducted in 2002 in Areas 4 and 7. The historical soil gas data may no longer be representative of the current site conditions because soil gas conditions have likely changed over the past 20 years due to contaminant migration and remedial actions at the source areas. However, 1,1,1-trichloroethane [1,1,1-TCA], trichloroethene (TCE), and tetrachloroethene (PCE) were frequently detected in soil gas samples collected in Areas 4, 7, and 9/10, and mitigation of vapor intrusion was not recommended at any of the buildings sampled based on the indoor air results. The following reports contain the historical vapor intrusion investigation results:

- Southeast Rockford Final Remedial Investigation Report (CDM 1995)
- Final Remedial Investigation Report for the Southeast Rockford Source Control Operable Unit (CDM 2000)
- Technical Memorandum: Southeast Rockford Indoor Air Sampling Study (CDM 2004)

2014 and 2015 Soil Gas Investigations

In 2014, a deep soil gas investigation was conducted by CH2M throughout the site. As part of the investigation, 48 permanent deep soil gas probes were installed within the groundwater plume extent as defined in *Statistical Analysis of Chemicals Concentrations in Groundwater and Mapping* (S.S. Papadopulos 2012). Two rounds of sampling were attempted at each soil gas probe. Eight of these probes were unable to be sampled because a vacuum in the probe was observed during purging. Detected concentrations of one or more site-specific VOCs exceeded EPA VISLs (i.e., the most recent version available at the time of sampling) at six of the 40 soil gas probes sampled in 2014. Based on the 2014 deep soil gas investigation findings, it was concluded that additional investigation of the potential for vapor intrusion at the site was necessary (CH2M 2015, 2016a).

In 2015, 22 additional permanent soil gas probes were installed at the site to refine the delineation of the soil gas plume and assess the vertical profile of site-related VOCs in the vadose zone. Two rounds of sampling were attempted at each newly installed soil gas probe, and 34 of the probes installed in 2014 that had detectable concentrations of site-specific VOCs below the EPA VISLs. A total of 61 soil gas probes, 10 of which were co-located dual-depth probes, was sampled at least once between 2014 and 2015.

Following 2014 and 2015 sampling, detected concentrations of one or more site-specific VOCs exceeded EPA VISLs at 7 of the 61 sampled soil gas probes. Several of these exceedances were observed in deep soil gas probes, where a co-located shallow probe at the same location had VOC concentrations less than VISLs. This suggested that deep soil gas contamination was not migrating upwards through the soil column at concentrations of concern for the vapor intrusion pathway at these locations. It was concluded that additional investigation of the potential for vapor intrusion at the site was necessary near three soil gas probes (SG-25, SG-51, and SG-66) where detected VOC concentrations exceeded VISLs (CH2M 2015, 2016a).

Field Activities

Field investigation activities were conducted in accordance with the UFP-QAPP (CH2M 2014), the UFP-QAPP Addendum I (CH2M 2015), the UFP-QAPP Addendum II (CH2M 2016b), and the UFP-QAPP Addendum III letter (CH2M 2017). Deviations from the UFP-QAPP and UFP-QAPP addendums are presented in Table 1. Field investigation activities were conducted on the dates shown in Table 2. A detailed discussion of the soil gas and interior vapor intrusion investigation activities is included in the following subsections. Photographs of the investigation activities are included in Attachment 1.

Field investigation activities were conducted on private properties within the City of Rockford. Prior to starting work, access agreements were sent to the owners of properties identified for sampling. Representatives of EPA visited the site on multiple occasions to attempt to meet with property owners who did not respond to the access agreement requests.

Deep Soil Vapor Investigation Activities—2016

Utility Locating

Underground utilities were identified and marked near each proposed exterior soil gas probe and soil boring location by the Indiana one-call service and by Blood Hound Inc., a private utility-locating subcontractor. The utility-locating subcontractor used ground-penetrating radar, electromagnetics, and a magnetometer to verify and mark the presence of subsurface utilities or other potential subsurface objects that could be damaged by intrusive work. Intrusive activities were not performed within 10 feet of an overhead power line or within 5 feet of a marked underground utility.

Soil Borings

Soil borings were collected at 7 of the soil gas probe locations installed in August 2016 (Figure 2). Soil borings were collected at these locations to obtain additional lithology and depth-to-groundwater data. Soil borings were collected from the properties proposed in the UFP-QAPP Addendum II (CH2M 2016b).

However, the final locations were adjusted as needed to avoid obstructions and accommodate property owner requests.

Terra Probe Environmental advanced the soil borings using hand augers or direct-push technology (DPT) using 4- or 5-foot-long Geoprobe Macro-Core Samplers with disposable liners. The method used to obtain the soil boring at each location was selected in the field by considering the ability for a drill rig to access the location (which was limited by narrow side-yards, landscaping, or steep topography). Soil borings were advanced with the drill rig or hand auger until saturated conditions were encountered or until refusal was reached. Soil borings were characterized by CH2M using the Unified Soil Classification System in accordance with ASTM International Standard Practice for Description and Identification of Soils (ASTM International D2488). Soil cores obtained from the DPT rig were also photographed. Soil boring logs are included in Attachment 2.

Exterior Soil Gas Probe Installation

Nine permanent soil gas probes were installed by Terra Probe Environmental in August 2016 using a DPT rig or hand augers (Figure 2). The probes were installed on the properties proposed in the UFP-QAPP Addendum II (CH2M 2016b); however, the final locations were adjusted as needed to avoid obstructions and accommodate property owner requests.

The exterior soil gas probes were installed after completion of the boring, once the desired bottom screen depth was achieved. If required, filter sand was used to fill the boring to the desired bottom screen depth before the probe screen and tubing were lowered to the bottom. Each exterior soil gas probe consists of a 6-inch-long, 0.5-inch-outer-diameter (OD) stainless-steel wire mesh screen attached to 0.25-inch-OD Teflon tubing that extends to the ground surface. Filter sand was placed around and at least 4 inches above the screen to prevent bentonite from clogging the screen. At least 1 foot of powdered bentonite was then placed above the filter sand. The remainder of each borehole was filled with granular bentonite and hydrated in lifts to the ground surface. Each probe was completed with a 6-inch-diameter, locking, trafficrated flush-mount cover secured with cement. Installation information for each probe is summarized in Table 3, and construction logs for the probes installed in August 2016 are included in Attachment 3. Deviations from the methods of construction specified in the UFP-QAPP Addendum II are summarized in Table 1.

The final location of each soil gas probe was documented with a handheld Trimble global positioning system (GPS) unit. GPS coordinates for each soil gas probe location are included in Table 3.

Exterior Soil Gas Probe Sampling

Prior to sampling, a helium-leak check was performed, and three dead volumes of soil gas were purged from each probe. One dead volume includes the volume of soil gas within the sand filter pack and sand backfill, plus the volume of soil gas within the probe tubing. Each volume of soil gas purged is screened with a helium detector and a photoionization detector. Except for one probe (SG-80) in August 2016, the soil gas probes passed the helium-leak checks prior to sampling. The probe that did not pass the helium-leak check in August 2016 had suspected methane interference based on photoionization detector and helium detector readings. The presence of methane gas in the subsurface has the potential to result in false readings on a helium detector. The sampling approach for this location was modified as described in Table 1, so that a sample could be collected.

Soil gas samples were collected from 7 of the 9 exterior soil gas probes during two separate sampling events in August and November/December 2016. Two of the soil gas probes (SG-74 and SG-79) could not be sampled because a vacuum in the probe was observed during purging, indicating that there was an insufficient volume of soil gas present. This occurs due to either fine-grained soils or groundwater within the probe. Soil present in the area is mostly very dense clay, which may be why sampling of these probes was infeasible.

Deep soil gas samples were collected from each soil gas probe in 1-liter evacuated canisters equipped with flow controllers set to 200 milliliters per minute. The exterior soil gas samples were analyzed for site-specific VOCs (1,1,1-TCA, 1,1,2-trichloroethane, 1,1-dichloroethane [1,1-DCA], 1,1-dichloroethene [1,1-DCE], 1,2-dichloroethane, cis-1,2-dichloroethene, benzene, ethylbenzene, methylene chloride, PCE, toluene, trans-1,2-dichloroethene, TCE, vinyl chloride, and xylenes) by EPA method TO-15.

The initial and final canister vacuums were measured in the field with a digital gauge. Exterior soil gas probe sampling forms are included in Attachment 4.

Interior Vapor Intrusion Sampling—2016 and 2017

Interior vapor intrusion sampling was performed at a total of four properties (Figure 3) in 2016 and 2017 as follows:

- Property 5 (commercial)³—Interior vapor intrusion sampling was performed in August and December 2016. Three subslab soil gas probes, two indoor air, and one outdoor air locations were sampled.
- Property 6 (residential)⁴—Interior vapor intrusion sampling was performed in August and December 2016, and again in June 2017 after nearby remedial activities were completed. Two subslab soil gas probes, one crawlspace air, two indoor air, and one outdoor air locations were sampled.
- Property 3 (residential)—Interior vapor intrusion sampling was performed in February and June 2017. Three subslab soil gas probes, two indoor air, and one outdoor air locations were sampled.
- Property 4 (residential)—Interior vapor intrusion sampling was performed in February and June 2017.
 Three subslab soil gas probes, two indoor air, and one outdoor air locations were sampled.

Utility Locating

Underground utilities were identified and marked by a private utility locator (Blood Hound, Inc.) before drilling and installation of the subslab soil gas probes. The concrete slab was scanned using ground-penetrating radar, and utilities were marked, if present. Rebar and other anomalies within and under the slab were also marked. The Illinois one-call service was also notified of drilling activities, for marking of public utilities leading into buildings.

Building Surveys

In order to identify and document building characteristics pertinent to vapor intrusion, building surveys were performed using the building survey form from the UFP-QAPP Addendum II. These surveys were reviewed prior to each sampling event, and updated as necessary. Building information, including building use, building history and occupancy, approximate building dimensions, concrete floor slab condition and type, general operation of the heating, ventilation, air-conditioning system, and atypical preferential pathways, were obtained by visual inspection and from discussions with the occupants.

Chemical products stored and activities performed within the building that could be potential sources of VOCs in indoor air (for example, paint, gasoline cans, solvents, cleaning products) were also identified. A photoionization detector with the capability of reading in units of parts per billion (ppbRAE) was used to screen for VOCs within the buildings, focusing on areas where chemical products that may contain or produce VOCs are stored, to determine if those products are confounding indoor VOC sources. With the

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³ Property 5 was previously identified as the commercial property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

⁴ Property 6 was previously identified as the residental property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

building occupants' permission, the identified potential confounding indoor VOC sources were documented and placed in plastic totes outside of the building prior to, and for the duration of, the air-sampling event.

Building survey forms are provided in Attachment 5.

Subslab Soil Gas Probe Installation

The locations of the subslab soil gas probes were selected during the building survey based upon the building survey results, the guidance outlined in the UFP-QAPP Addendum II, and property owner preference. Subslab soil gas probes were installed in 11 locations at 4 properties. Up to three subslab soil gas probes were installed in each building. To install each subslab soil gas probe, a hole was drilled through the concrete slab of a building using a rotary hammer drill and a Cox-Colvin & Associates, Inc. Vapor Pin was inserted into the hole. A flushmount stainless-steel cover was installed to cover each probe. Locations of the subslab soil gas probes installed in each building are documented on the building survey forms (Attachment 5).

Subslab Soil Gas, and Indoor, Crawlspace, and Outdoor Air Sampling

Prior to sampling during each event, each property was re-screened with a ppbRAE to verify that there were no new products that may be confounding indoor air VOC sources. Subslab soil gas, indoor air, crawlspace air (when present), and outdoor air samples were collected at each property concurrently over a 24-hour period for residential properties and an 8-hour period for commercial properties. Sampling activities took place at least 72 hours after completing subslab soil gas probe installation activities to allow indoor air conditions to equilibrate. Subslab soil gas, indoor air, and crawlspace air sampling forms are included in Attachment 6.

A water dam leak check was performed on each subslab soil gas probe to verify they were installed correctly. A vacuum pump was used to purge 1 liter of soil gas at a rate of 200 milliliters per minute at each subslab probe, and the concentration of total VOCs in purged soil gas was measured with a photoionization detector. Each subslab soil gas probe passed the leak check prior to sampling (see Attachment 6)

In accordance with the QAPP Addendum II, two indoor air samples were collected from each property during each sampling round, except where noted in Table 1. At each property, one indoor air sample was collected from the basement, and the other was collected from the first floor. Indoor air sample locations were selected based on the building survey results, the guidance outlined in the QAPP Addendum II, and property owner preference.

When crawlspaces were identified in a building, crawlspace air samples were collected instead of subslab soil gas samples in that portion of the building (none of the properties sampled had a complete crawlspace). Three subslab soil gas and/or crawlspace air samples were collected from each property each event. Crawlspaces were sampled as found (i.e., if open, were sampled open; if closed, were sampled closed). Canisters were connected to Teflon tubing that was inserted through a loose-fitting polyvinyl chloride guide pipe into the crawlspace so the tubing inlet could be placed at least several inches off the ground and directed to the center of the crawlspace.

One outdoor air sample was collected at each property concurrently with the subslab soil gas, crawlspace air, and indoor air sampling. Outdoor air samples were placed in an upwind location (based upon prevailing winds over the 24-hour sample period) of the buildings being sampled and were secured to an immoveable structure (such as fence, fence post, stop sign, etc.) with a bike lock for security.

Subslab soil gas, indoor air, crawlspace air, and outdoor air samples were collected in 6-liter evacuated canisters. The canisters at residential properties were collected over a period of approximately 24 hours, and the canisters at the commercial property were collected over a period of approximately 8 hours. The initial and final canister vacuums were measured in the field with a digital gauge. Sampling forms are included in Attachment 6. The subslab soil gas samples were analyzed for site-specific VOCs (1,1,1-TCA,

1,1,2-trichloroethane, 1,1-DCA, 1,1-DCE, 1,2-dichloroethane, cis-1,2-dichloroethene, benzene, ethylbenzene, methylene chloride, PCE, toluene, trans-1,2-dichloroethene, TCE, vinyl chloride, and xylenes) by EPA Method TO-15, and the indoor air, crawlspace air, and outdoor air samples were analyzed for the same site-specific VOCs by EPA method TO-15 SIM.

In accordance with the QAPP Addendum II, because industrial facilities typically have confounding indoor air sources, the indoor air samples collected from the commercial property were held for analysis pending the results of the subslab soil gas samples. Per direction from EPA, because the detected concentrations in the subslab soil gas samples were below commercial VISLs, the indoor air and outdoor air samples collected at the commercial property in December 2016 were not analyzed.

Quality Assurance/Quality Control Samples

Quality assurance (QA)/quality control (QC) field duplicate samples were collected at a frequency of at least 10 percent during the 2016 and 2017 sampling events, in accordance with the UFP-QAPP and UFP-QAPP Addendums. Duplicate air and soil gas samples were collected using T-connectors so that the parent and duplicate samples were collected simultaneously.

Field Equipment Decontamination

Disposable materials (core liners) were used for the collection of soil cores. Non-disposable equipment (drilling rods and hand auger) used during the soil gas investigation was decontaminated by washing with Alconox, followed by a water rinse prior to reuse. Cleaned and certified canisters and flow controllers were provided by the laboratory.

Investigation-derived Waste

Investigation-derived waste (IDW) generated during collection of the soil cores and installation of the exterior deep soil gas probes installed in August of 2016 included three waste streams: soil, decontamination water, and personal protective equipment/disposable sampling equipment (core liners). Each waste stream was separately containerized in 55-gallon drums and placed in a secured staging area located within the site. No IDW was generated during the work conducted in 2017.

IDW was characterized and disposed of as nonhazardous waste in accordance with the UFP-QAPP Addendum II. Soil IDW samples were analyzed for the following: toxicity characteristic leaching procedure (TCLP) VOCs, TCLP semivolatile organic compounds (SVOCs), TCLP metals (including mercury), TCLP pesticides, TCLP herbicides, total polychlorinated biphenyls, pH, flashpoint, and percent moisture. Aqueous samples were collected and analyzed for the following: VOCs, SVOCs, pesticides, herbicides, Resource Conservation and Recovery Act metals, and corrosivity. Waste characterization results and documentation of IDW disposal are included in Attachment 7.

Data Validation

In accordance with the UFP-QAPP and QAPP Addendums, a Level III validation was performed on 100 percent of the data, and a Level IV validation was performed on 10 percent of the data. Validated analytical results are presented in Tables 5 to 9. The data quality evaluation memorandums are included in Attachment 8.

Screening Levels

The screening levels used to evaluate the exterior soil gas, subslab soil gas, indoor air, and crawlspace air sampling results were obtained from the EPA VISL Calculator Version 3.5.1 (EPA 2016) using the June 2017 Regional Screening levels (EPA 2017). The soil gas and air VISLs are based on a target risk of 1×10^{-5} and a target hazard quotient (HQ) of 1, and. The soil gas and air Risk Management Levels (RMLs) are based on a target risk of 1×10^{-4} and a target HQ of 3, except for TCE, which is based on a target HQ of 1.

Screening levels were calculated for both residential and commercial exposure scenarios. The residential soil gas screening levels were used to evaluate the exterior soil gas sampling results. The commercial screening levels were used to evaluate the interior vapor intrusion sampling results from the one commercial property and the residential screening levels were used to evaluate the three residential properties. EPA VISLs were used to evaluate long-term risks, and EPA RML equivalents were used to evaluate short-term risks.

Investigation Results

Site Geology and Hydrogeology

In general, soils encountered during drilling activities at the site consisted of silt, clay, and sandy clay mixtures. Occasional sand and gravel seams, when present, generally occur around 10 feet below ground surface and are several feet thick.

Groundwater was encountered in six of the soil borings at the site at a depth ranging from 7.5 to 22 feet below ground surface during drilling activities. The depth to groundwater increases towards the west along Balsam Lane and Bannister Drive, and is shallow (about 7.5 feet) to the north of Balsam Lane and Bannister Drive.

Deep Exterior Soil Gas Probes Sample Results

VOC Results

Exterior soil gas sampling results from 2016 were evaluated according to the specific objectives outlined in the UFP-QAPP Addendum II. Deep soil gas analytical results were screened against EPA soil gas VISLs (Table 4). Three of the 7 exterior soil gas probes sampled in August 2016 had detected concentrations of one or more site-specific VOCs that exceeded the EPA soil gas VISLs. The following VOCs were detected at concentrations exceeding the EPA soil gas VISLs: benzene, ethylbenzene, and xylenes (Table 5). Soil gas probes with VOC detections exceeding VISLs in 2016 are shown in Figure 4. Detected concentrations of site-specific VOCs were less than the EPA soil gas VISLs in December 2016. Detected concentrations of site-specific VOCs were less than the EPA soil gas RMLs in August and December 2016.

Helium Results

The soil gas probe SG-80 did not pass the helium-leak check in August 2016, likely due to methane interference. The presence of methane gas in the subsurface has the potential to result in false readings on a helium detector. Based upon lower explosive limit concentrations measured in soil gas at this probe, methane interference was suspected. For this reason, the sample from probe SG-80 was also analyzed for helium to evaluate the integrity of the soil gas probe. A concentration of at least 20 percent helium was maintained in a shroud over the probe during sampling. Helium was detected at a concentration of 90 parts per million volume in the laboratory sample. The concentration detected in the sample was less than 1 percent of that maintained in the shroud; therefore, the probe passed the leak check during August 2016 sampling. Helium analytical results are presented in Table 8.

Interior Vapor Intrusion Sample Results

The interior vapor intrusion sampling results from the four properties sampled in 2016 and 2017 were evaluated according to the specific objectives outlined in the UFP-QAPP Addendum II and UFP-QAPP Addendum III. The sampling results compared to screening levels are provided in Tables 5 to 7. The vapor intrusion evaluation results for each property are presented in the following subsections.

Property 5 (Commercial)

Three subslab soil gas, two indoor air, and one outdoor air samples were collected at Property 5 in August and November 2016 (Tables 5 to 7).

- Subslab soil gas—TCE was measured in one of the three subslab soil gas samples at a concentration above the EPA commercial soil gas RML in August 2016. However, detected concentrations of sitespecific VOCs were less than the EPA commercial soil gas VISLs and RMLs in the three subslab soil gas samples in November 2016.
- Indoor Air—Detected concentrations of site-specific VOCs were less than the EPA commercial indoor air VISLs (and RMLs) in August 2016. The November 2016 indoor air samples were not analyzed because detected concentrations of site-specific VOCs in the subslab soil gas samples were less than the EPA commercial VISLs.

The vapor intrusion pathway is not currently complete or significant at Property 5 because indoor air concentrations of site-specific VOCs were below the EPA commercial indoor air VISLs. However, there is a potential for this to occur in the future because TCE was measured in subslab soil gas at a concentration above the EPA commercial soil gas RML.

Property 6 (Residential)

Two subslab soil gas, one crawlspace air, two indoor air, and one outdoor air samples were collected at Property 6 in August and November 2016, and again in June 2017 after nearby Source Area 4 remedial actions were completed by IEPA (Tables 5 to 7).

- Subslab soil gas—TCE was measured in one of the two subslab soil gas samples at a concentration above
 the EPA residential soil gas RML in August 2016. However, detected concentrations of site-specific VOCs
 were less than the EPA residential soil gas VISLs and RMLs in the two subslab soil gas samples in
 November 2016 and June 2017.
- Crawlspace air—
 - TCE was detected in the crawlspace air sample at a concentration above the EPA residential indoor air RML in August 2016.
 - 1,2-Dichloroethane (1,2-DCA) was detected at concentrations above the EPA residential indoor air VISL in August 2016; however, 1,2-DCA was not detected in subslab soil gas in August 2016 or June 2017, and in November 2016 the detected concentrations of 1,2-DCA in subslab soil gas were an order of magnitude less than detected concentrations in the crawlspace. Additionally, detected concentrations of 1,2-DCA in the August 2016 indoor air sample (collected on the first floor) were greater than detected concentrations in the crawlspace. Therefore, the presence of 1,2-DCA in crawlspace air is likely related to an indoor VOC source and not vapor intrusion.
- Indoor air—1,2-DCA was detected in the August 2016 first-floor air sample and June 2017 basement
 indoor air samples at concentrations above the EPA residential indoor air VISL. As discussed above, its
 presence in indoor air and crawlspace air is likely related to an indoor source and not vapor intrusion.

The vapor intrusion pathway is not currently complete or significant at Property 6 because either the detected concentrations of site-specific VOCs in indoor air were below the EPA residential indoor air VISLs, or they were likely related to an unidentified confounding indoor air source. Although TCE was measured in the August 2016 subslab soil gas and crawlspace air samples at concentrations above the EPA residential RMLs, TCE concentrations at these sample locations were below the EPA residential VISLs/RMLs in the June 2017 samples (that is, after remedial actions were completed).

Comparison of cooling season subslab soil gas data collected before and after the Source Area 4 remedial actions (August 2016 and June 2017) indicate that the remedial actions reduced concentrations of site-related VOCs in subslab soil gas. Detected concentrations of site-specific VOCs were less than the EPA residential soil gas VISLs in the June 2017 subslab soil gas samples, indicating that the vapor intrusion pathway is expected to be incomplete in the future if site conditions remain the same.

Property 3 (Residential)

Three subslab soil gas, two indoor air, and one outdoor air samples were collected at Property 3 in February and June 2017 (Tables 5 to 7).

- Subslab soil gas—Detected concentrations of site-specific VOCs were less than the EPA residential soil gas VISLs and RMLs in February and June 2017.
- Indoor air—1,2-DCA and benzene were detected at concentrations above the EPA residential indoor air VISLs in February and June 2017 in the basement and first-floor indoor air samples. However, it is likely that these detections are related to a confounding indoor source (as opposed to vapor intrusion) because detected concentrations of 1,2-DCA and benzene in subslab soil gas were an order of magnitude less than concentrations in indoor air. Additionally, detected concentrations of 1,2-DCA and benzene in the samples collected from the first floor were greater than the samples collected in the basement.

The vapor intrusion pathway is not currently complete or significant at Property 3 because the detected concentrations of site-specific VOCs in indoor air were either below the EPA residential indoor air VISLs or they were likely related to an unidentified confounding indoor air source. The vapor intrusion pathway is expected to be incomplete in the future if site conditions remain the same because subslab soil gas concentrations of site-specific VOCs were below the EPA residential soil gas VISLs.

Property 4 (Residential)

Three subslab soil gas, two indoor air, and one outdoor air samples were collected at Property 4 in February and June 2017 (Tables 5 to 7).

- Subslab soil gas—Detected concentrations of site-specific VOCs were less than the EPA residential soil gas VISLs and RMLs in February and June 2017.
- Indoor air —1,2-DCA was detected at concentrations above the EPA residential indoor air VISL in
 February and June 2017 in the basement and first-floor indoor air samples. However, it is likely that
 these detections are related to a confounding indoor source (as opposed to vapor intrusion) because
 detected concentrations of 1,2-DCA in subslab soil gas were an order of magnitude less than
 concentrations in indoor air. Additionally, detected concentrations of 1,2-DCA in the samples collected
 from the first floor were greater than the samples collected in the basement.

The vapor intrusion pathway is not currently complete or significant at Property 4 because the detected concentrations of site-specific VOCs in indoor air were either below the EPA residential indoor air VISLs or they were likely related to an unidentified confounding indoor air source. The vapor intrusion pathway is expected to be incomplete in the future if site conditions remain the same because subslab soil gas concentrations of site-specific VOCs were below the EPA residential soil gas VISLs.

Conclusions

Exterior soil gas sampling performed at the site from 2014 to 2016 indicated that there was a potential for vapor intrusion impacts to six properties. Access for vapor intrusion investigation was granted for four of the six properties: one commercial and three residential. Interior vapor intrusion sampling was performed at these four properties in 2016 and 2017. The interior sampling results indicate that the vapor intrusion pathway is not currently complete or significant at these four properties. The vapor intrusion pathway is expected to be incomplete in the future at the three residential properties if site conditions remain the same. There is a potential for the vapor intrusion pathway to become complete and significant at the one commercial property because subslab soil gas concentrations of TCE exceeded the EPA commercial soil gas RML.

Technical Exceptions for Vapor Intrusion Investigations

The technical memorandum provides results regarding the potential occurrence and significance of vapor intrusion based on reasonably obtainable sampling data and observations.

The vapor intrusion investigation does not address other indoor air quality problems, including mold or mildew, radon, building air quality unrelated to subsurface site-specific VOCs, or general indoor ventilation issues.

The vapor intrusion investigation and technical memorandum do not address landfill gas or explosive atmospheres.

The technical memorandum provides comparisons of subslab soil vapor, crawlspace air, and indoor air data with EPA VISLs and RMLs. The comparisons are not intended to imply the presence or absence of healthful or safe indoor air quality, and do not represent any medical opinion.

The results and conclusions presented in the technical memorandum are developed for land uses and site conditions as characterized by the available data. Any changes in land use or site conditions based on additional information may warrant reevaluation of the results and conclusions of the vapor intrusion investigation.

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Tables

Table 1. Summary of Deviations from the UFP-QAPP and UFP-QAPP Addendums

Southeast Rockford Groundwater Contamination Superfund Site, Rockford, IL

Type of Deviation	Deviation from the UFP-QAPP or UFP-QAPP Addendums
Exterior Soil Gas Investigation	201410111111111111111111111111111111111
Moved Soil Gas Probe and Soil Boring Locations	The soil gas probes were installed on the properties proposed in the UFP-QAPP Addendum II, however the final locations were adjusted as needed to avoid obstructions and accommodate property owner requests.
Soil Gas Probe Installation Method	Soil gas probes were installed with a hand auger at several locations instead of a drill rig for the following reasons: • The drill rig was not able to access the installation location (SG-78 and SG-82). • the drill rig equipment malfunctions (SG-80 and SG-81).
Exterior Soil Gas Probe Construction	Due to the shallow installation depth of soil gas probe SG-75, the construction was modified to have approximately 4 inches of sand above the top of the screen instead of 6 inches, and one foot of dry bentonite seal instead of three feet.
	Due to the shallow installation depth of soil gas probe SG-81, the amount of dry bentonite seal was modified to two feet instead of three feet.
	Two of the exterior soil gas probes (SG-79 and SG-80) were inadvertently installed with over 12 inches of sand above the top of the screen instead of 6 inches. When the probe depth allowed (SG-74, SG-76, SG-77, SG-78, SG-79, SG-80, SG-81, and SG-82), the quantity of dry
	bentonite was increased from 3 feet, to ensure a good seal at the probe.
Type/Quantity of Exterior Soil Gas Samples Collected	Two of the exterior soil gas probes were unable to be sampled due to a vacuum observed in each of the probes during purging (a vacuum is usually observed if a probe is installed in dense soil or if it is installed in the water table).
	 One of the probes (SG-79) was installed in dense soil (mostly silts) at a depth greater than 5 feet above the water table.
	• A soil boring was not completed at the other probe location (SG-74) per request of EPA and this change was documented in the revision to the Work Plan for the site. Therefore, the probe was blind installed based upon the water elevations historically observed at monitoring well MW-133A and the groundwater elevations at the other soil borings completed in the area. It is unknown what subsurface condition has contributed to not being able to collect a sample.
	During sampling activities, it was noted that a minimal amount of soil vapor was present at one of the exterior soil gas probes (SG-80). After discussions with EPA, the sampling approach was modified from the QAPP Addendum II due to limited soil vapor at this location. The modified sample approach was as follows: soil vapor was purged from the probe before a vacuum was observed, then purging was stopped, and the probe was allowed to recover before it was purged more. This process was continued until one volume of soil gas was removed from the probe, and then the probe was sampled. Additionally, due to suspected methane interference at this probe, the sample was collected with helium on in sampling shroud. The sample from this location was submitted for helium analysis addition to volatile organic compounds (VOCs) in August 2016 to confirm the probe was leak free.
Rate of Sample Collection	During the August and December 2016 sampling events, some of the flow controllers for exterior soil gas sample locations were set at a slightly higher or slightly lower flow rate lower than specified in the UFP-QAPP Addendum II. This resulted in the sample being collected slightly faster or slower than specified in the UFP-QAPP Addendum II (4-10 minute sample time).
	As discussed above the sample collection method was modified for SG-80 which resulted in the samples being collected over a longer period of time than specified in the UFP-QAPP Addendum II.
Final Sample Canister Pressures	The UFP-QAPP Addendum I specifies a desired canister final ending pressure between -2 to -5 inches of mercury for a 1-liter canisters. There were several occurrences where the final canister pressure was outside of this ideal range. In some cases, the ending canister pressure was greater than -2, and in some cases, less than -5. The final ending pressure did not affect data quality or elevate the laboratory detection limits above screening criteria.
Vapor Intrusion Investigation	
Quantity of Properties Sampled	The property owner for Property 2 was not responsive to requests to schedule sampling; therefore, this property was not sampled in 2017.
	Access was not granted to Property 1 which resulted in the overall total number of properties sampled being reduced.
Rate of Sample Collection	During sampling activities in August 2016, one flow controller had a flow rate set higher than specified in the UFP-QAPP Addendum II. This resulted in the sample being collected more rapidly, and the ending pressure of the canister was zero when samples were picked up. Per conversations with the CH2M senior technical resource and EPA on August 17, 2016, it was determined that sufficient samples had been collected at this property to assess the vapor intrusion (VI) pathway and did not require a resampling of this indoor air sample.
Final Sample Canister Pressures	The UFP-QAPP Addendum II specifies a desired canister final ending pressure between -10 to -2 inches of mercury for a 6-liter canister. There were several occurrences where the final canister pressure was outside of this ideal range. In some cases, the ending canister pressure was greater than -2, and in some cases, less than -10. The final ending pressure did not affect data quality or elevate the laboratory detection limits above screening criteria.

Table 2. Investigation Activities Dates

Date	Field Activities
August 8 through 19, 2016	Utility locating
	• Collection of soil borings
	• Installation of exterior soil gas probes
	• Collection of exterior soil gas probe samples
	Collection of investigation derived waste samples
	Building surveys at two properties
	• Installation of subslab gas probes at 2 properties
	•Collection of subslab soil gas samples, indoor air samples, and crawlspace air samples (where present)
	at 2 properties
	•Collection of outdoor air samples
November 28 through December 1,	• Collection of exterior soil gas probe samples
2016	• Collection of subslab soil gas samples, indoor air samples, and crawlspace air samples (where
	present) at 2 properties
	• Collection of outdoor air samples
February 15 through 23, 2017	Utility locating
	Building surveys
	• Installation of subslab gas probes at 2 properties
	• Collection of subslab soil gas samples and indoor air samples at 2 properties
	• Collection of outdoor air samples
June 7 through 10, 2017	• Collection of subslab soil gas samples, indoor air samples, and crawlspace air samples (when present)
	at 3 properties
	• Collection of outdoor air samples

Table 3. Exterior Soil Gas Probe Installation Summary - August 2016

Probe Location	Northing ^a	Easting ^a	Screen Length (inches)	Bottom of Screened Interval (ft bgs)
SG-74	non-resp	onsive	6	11.8
SG-75			6	5.8
SG-76	-		6	15.0
SG-77			6	16.4
SG-78			6	11.4
SG-79			6	13.4
SG-80			6	11.3
SG-81			6	8.0
SG-82			6	13.4

ft bgs = feet below ground surface

^a NAD83 Illinois State Plane West, US Feet.

^b All soil gas probes were installed in Rockford, IL.

Table 4. Exterior Soil Gas Probe Sampling Results - 2016

			Residential Soil	SER-S	SG-75		SER-SG-76		SER-SG-77				
		Residential	Gas RML	SER-SG-75-0816	SER-SG-75-1216	SER-SG-76-0816	SER-SG-76-0816-FD	SER-SG-76-1216	SER-SG-77-0816	SER-SG-77-1216	SER-SG-77-1216-FD		
Compound	Units	Soil Gas VISL ^a	Equivalent ^b	8/18/2016	12/1/2016	8/18/2016	8/18/2016	12/1/2016	8/16/2016	12/1/2016	12/1/2016		
1,1,1-Trichloroethane	ug/m³	170,000	520,000	7.6 U	2 U	64	65	59	180	150	150		
1,1,2-Trichloroethane	ug/m³	7	21	7.6 U	2 U	2.5 U	2.6 U	1.8 U	1.9 U	2.2 U	2.2 U		
1,1-Dichloroethane	ug/m³	580	5,800	7.6 U	2 U	2.5 U	2.6 U	1.8 U	1.9 U	2.2 U	2.2 U		
1,1-Dichloroethene	ug/m³	7,000	21,000	7.6 U	2 U	2.5 U	2.6 U	2.5	1.9 U	4.7	5.3		
1,2-Dichloroethane	ug/m³	36	360	7.6 U	2 U	2.5 U	1.3 J	1.8 U	1.9 U	2.2 U	2.2 U		
Benzene	ug/m³	120	1,200	52	2 U	36	37	0.58 J	4.4	2.2 U	2.2 U		
cis-1,2-Dichloroethene	ug/m³			7.6 U	2 U	1.1 J	2.6 U	1.8 U	1.9 U	2.2 U	2.2 U		
Ethylbenzene	ug/m³	370	3,700	660	2 U	130	130	1.8 U	13	2.2 U	2.2 U		
Methylene Chloride	ug/m³	21,000	63,000	7.6 U	2 U	2 J	2.8	1.8 U	8.6	2.2 U	2.2 U		
Tetrachloroethene	ug/m³	1,400	4,200	13	2 U	11	2.4 J	1.4 J	13	14	15		
Toluene	ug/m³	170,000	520,000	1,300 J	2 U	370 J	380 J	0.77 J	30 J	2.2 U	2.2 U		
trans-1,2-Dichloroethene	ug/m³			7.6 U	2 U	2.5 U	2.6 U	1.8 U	1.9 U	2.2 U	2.2 U		
Trichloroethylene	ug/m³	70	70	7.6 U	2 U	0.98 J	2.6 U	1.8 U	2.9	2.8	2.7		
Vinyl Chloride	ug/m³	56	560	7.6 U	2 U	2.5 U	2.6 U	1.8 U	1.9 U	2.2 U	2.2 U		
Xylene, o	ug/m ³			670	0.87 J	110	110	1.8 U	13	2.2 U	2.2 U		
Xylenes, m & p	ug/m ³			2,600	4 U	450	470	3.5 U	44	4.5 U	4.5 U		
Total Xylenes	ug/m³	3,500	10,000	3,270	0.87 J	560	580	ND	57	ND	ND		

^{-- =} not applicable; no criteria available

RML = risk management level

RSL = regional screening level

SG = deep soil gas sample

ND = not detected

 $\mu g/m^3$ = micrograms per cubic meter

VISL = vapor intrusion screening level

Detected results are bolded.

Highlighted results exceed the Residential Soil Gas VISL^a

Underlined results exceed the Residential Soil Gas RML Equivalent.^b

 $^{^{\}rm a}$ The EPA Residential Soil Gas VISLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a residential exposure scenario with a target cancer risk of 10^5 and a target hazard quotient of 1.

 $^{^{\}rm b}$ The EPA Residential Soil Gas RMLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a residential exposure scenario with a target cancer risk of 10^4 and a target hazard quotient of 3 with the exception of trichloroethene which is based on a target hazard quotient of 1.

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

Table 4. Exterior Soil Gas Probe Sampling Results - 2016

			Residential Soil	SER-	SG-78	SER-S	G-80	SER-S	G-81	SER-SG-82		
		Residential	Gas RML	SER-SG-78-0816	SER-SG-78-1216	SER-SG-80-0816	SER-SG-80-1216	SER-SG-81-0816	SER-SG-81-1216	SER-SG-82-0816	SER-SG-82-1216	
Compound	Units	Soil Gas VISL ^a	Equivalent ^b	8/16/2016	12/1/2016	8/18/2016	12/1/2016	8/18/2016	12/1/2016	8/18/2016	12/1/2016	
1,1,1-Trichloroethane	ug/m³	170,000	520,000	160	89	13 J	13	2.1 U	1.9 U	2.2 U	2.4 U	
1,1,2-Trichloroethane	ug/m³	7	21	2.2 U	3 U	14 U	2.4 U	2.1 U	1.9 U	2.2 U	2.4 U	
1,1-Dichloroethane	ug/m³	580	5,800	2.2 U	3 U	14 U	2.4 U	2.1 U	1.9 U	2.2 U	2.4 U	
1,1-Dichloroethene	ug/m³	7,000	21,000	2.2 U	3.1	14 U	2.4 U	2.1 U	1.9 U	2.2 U	2.4 U	
1,2-Dichloroethane	ug/m³	36	360	2.2 U	3 U	14 U	2.4 U	2.1 U	1.9 U	2.2 U	2.4 U	
Benzene	ug/m³	120	1,200	7.4	3 U	250	1.3 J	49	1.9 U	160	2.4 U	
cis-1,2-Dichloroethene	ug/m³			2.2 U	3 U	14 U	2.4 U	2.1 U	1.9 U	2.2 U	2.4 U	
Ethylbenzene	ug/m³	370	3,700	79	3 U	850	1.5 J	180	1.9 U	350	0.83 J	
Methylene Chloride	ug/m³	21,000	63,000	0.89 J	3 U	14 U	2.4 U	2.1 U	1.9 U	1.6 J	2.4 U	
Tetrachloroethene	ug/m³	1,400	4,200	17	13	4.7 J	0.83 J	0.66 J	1.9 U	1.7 J	2.4 U	
Toluene	ug/m³	170,000	520,000	160 J	1.3 J	2,300 J	3.6	440	1.9 U	1,500	2.6	
trans-1,2-Dichloroethene	ug/m³			2.2 U	3 U	14 U	2.4 U	2.1 U	1.9 U	2.2 U	2.4 U	
Trichloroethylene	ug/m ³	70	70	2.2 U	3 U	14 U	2.4 U	2.1 U	1.9 U	2.2 U	2.4 U	
Vinyl Chloride	ug/m³	56	560	2.2 U	3 U	14 U	2.4 U	2.1 U	1.9 U	2.2 U	2.4 U	
Xylene, o	ug/m ³			99	3 U	590	3.1	170	1.9 U	280	3.6	
Xylenes, m & p	ug/m³			350	6.1 U	3,000	4.7 J	560	3.9 U	1,500	6.8	
Total Xylenes	ug/m ³	3,500	10,000	449	ND	3,590	7.8 J	730	ND	1,780	10.4	

-- = not applicable; no criteria available

RML = risk management level

RSL = regional screening level

SG = deep soil gas sample

ND = not detected

 $\mu g/m^3$ = micrograms per cubic meter

VISL = vapor intrusion screening level

Detected results are bolded.

Highlighted results exceed the Residential Soil Gas VISL^a

Underlined results exceed the Residential Soil Gas RML Equivalent.^b

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

 $^{^{\}rm a}$ The EPA Residential Soil Gas VISLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a residential exposure scenario with a target cancer risk of 10^5 and a target hazard quotient of 1.

 $^{^{\}rm b}$ The EPA Residential Soil Gas RMLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a residential exposure scenario with a target cancer risk of 10^4 and a target hazard quotient of 3 with the exception of trichloroethene which is based on a target hazard quotient of 1.

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

Table 5. Subslab Gas Sampling Results - August 2016 to June 2017

			Residential Soil		Commercial Soil	cial Soil Property 3 (Residental)							
		Residential	Gas RML	Commercial Soil	Gas RML	SER-SS-06-0217	SER-SS-06-062017	SER-SS-07-0217	SER-SS-07-062017	SER-SS-07-062017-FD	SER-SS-08-0217	SER-SS-08-0217-FD	SER-SS-08-062017
Compound	Units	Soil Gas VISL ^a	Equivalent ^b	Gas VISL ^{a*}	Equivalent ^{b*}	2/23/2017	6/8/2017	2/23/2017	6/8/2017	6/8/2017	2/23/2017	2/23/2017	6/8/2017
1,1,1-Trichloroethane	ug/m ³	170,000	520,000	730,000	2,200,000	0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
1,1,2-Trichloroethane	ug/m³	7	21	29	88	0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
1,1-Dichloroethane	ug/m³	580	5,800	2,600	26,000	0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
1,1-Dichloroethene	ug/m ³	7,000	21,000	29,000	88,000	0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
1,2-Dichloroethane	ug/m ³	36	360	160	1,600	0.94 U	0.35 J	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
Benzene	ug/m ³	120	1,200	520	5,200	0.94 U	0.37 J	0.34 J	0.92 U	0.98 U	0.81 U	0.79 U	1 U
cis-1,2-Dichloroethene	ug/m ³					0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
Ethylbenzene	ug/m ³	370	3,700	1,600	16,000	1.2	1.7	0.29 J	0.92 U	0.98 U	0.81 U	0.79 U	0.56 J
Methylene Chloride	ug/m ³	21,000	63,000	88,000	260,000	0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
Tetrachloroethene	ug/m ³	1,400	4,200	5,800	18,000	4	2	0.72 J	0.82 J	0.79 J	0.82	1.6	1.1
Toluene	ug/m ³	170,000	520,000	730,000	2,200,000	0.97	15	0.94	1.3	1.2	0.49 J	0.5 J	3.5
trans-1,2-Dichloroethene	ug/m ³					0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
Trichloroethylene	ug/m ³	70	70	290	290	0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.77 J	1 U
Vinyl Chloride	ug/m ³	56	560	930	9,300	0.94 U	0.97 U	0.73 U	0.92 U	0.98 U	0.81 U	0.79 U	1 U
Xylene, o	ug/m ³					0.61 J	2.8	0.47 J	0.35 J	0.33 J	0.29 J	0.26 J	0.92 J
Xylenes, m & p	ug/m ³					1.7 J	6.7	1.1 J	0.86 J	0.77 J	0.72 J	0.64 J	2.2
Total Xylenes	ug/m ³	3,500	10,000	15,000	44,000	2.31 J	9.5	1.57 J	1.21 J	1.1 J	1.01 J	0.9 J	3.12 J

^{-- =} not applicable; no criteria available

ND = not detected

RML = risk management level

RSL = regional screening level

SS = subslab sample

VISL = vapor intrusion screening level

 $\mu g/m^3 = micrograms per cubic meter$

Detected results are bolded.

Highlighted results exceed the Residential or Commercial Soil Gas VISL. a or a*

<u>Underlined results exceed the Residential or Commercial Soil Gas RML Equivalent.</u> borb*

^a The EPA Soil Gas VISLs were calculated using the EPA VISL Calculator Version 3.5.1, (June 2017 RSLs) based on a target cancer risk of 10^{-5} and a target hazard quotient of 1.

^b The EPA Soil Gas RMLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a target cancer risk of 10^{-4} and a target hazard quotient of 3, with the exception of trichloroethene which is based on a target hazard quotient of 1.

^cProperty 5 was previously identified as the commercial property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

^dProperty 6 was previously identified as the residental property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

Table 5. Subslab Gas Sampling Results - August 2016 to June 2017

			Residential Soil		Commercial Soil	oil Property 4 (Residental)							
		Residential	Gas RML	Commercial Soil	Gas RML	SER-SS-09-0217	SER-SS-09-062017	SER-SS-10-0217	SER-SS-10-062017	SER-SS-11-0217	SER-SS-11-062017		
Compound	Units	Soil Gas VISL ^a	Equivalent ^b	Gas VISL ^{a*}	Equivalent ^{b*}	2/23/2017	6/8/2017	2/23/2017	6/8/2017	2/23/2017	6/8/2017		
1,1,1-Trichloroethane	ug/m³	170,000	520,000	730,000	2,200,000	0.79 U	0.97 U	0.76 U	0.68 U	0.8 U	0.97 U		
1,1,2-Trichloroethane	ug/m³	7	21	29	88	0.79 U	0.97 U	0.76 U	0.68 U	0.8 U	0.97 U		
1,1-Dichloroethane	ug/m³	580	5,800	2,600	26,000	0.79 U	0.97 U	0.76 U	0.68 U	0.8 U	0.97 U		
1,1-Dichloroethene	ug/m³	7,000	21,000	29,000	88,000	0.79 U	0.97 U	0.76 U	0.68 U	0.8 U	0.97 U		
1,2-Dichloroethane	ug/m³	36	360	160	1,600	0.79 U	0.97 U	0.76 U	0.64 J	0.8 U	0.97 U		
Benzene	ug/m³	120	1,200	520	5,200	0.79 U	0.97 U	0.32 J	0.26 J	0.8 U	0.97 U		
cis-1,2-Dichloroethene	ug/m³					0.79 U	0.97 U	0.76 U	0.68 U	0.8 U	0.97 U		
Ethylbenzene	ug/m³	370	3,700	1,600	16,000	0.43 J	1.1	0.44 J	0.47 J	0.37 J	1		
Methylene Chloride	ug/m³	21,000	63,000	88,000	260,000	0.79 U	0.97 U	0.76 U	0.68 U	0.8 U	0.97 U		
Tetrachloroethene	ug/m³	1,400	4,200	5,800	18,000	0.42 J	0.29 J	0.33 J	0.27 J	0.32 J	0.3 J		
Toluene	ug/m³	170,000	520,000	730,000	2,200,000	0.99	8.4	1.1	3.4	1	3.4		
trans-1,2-Dichloroethene	ug/m³					0.79 U	0.97 U	0.76 U	0.68 U	0.8 U	0.97 U		
Trichloroethylene	ug/m³	70	70	290	290	0.79 U	0.97 U	3.6	0.23 J	0.31 J	0.97 U		
Vinyl Chloride	ug/m³	56	560	930	9,300	0.79 U	0.97 U	0.76 U	0.68 U	0.8 U	0.97 U		
Xylene, o	ug/m³					0.73 J	2	0.78	0.65 J	0.64 J	1.8		
Xylenes, m & p	ug/m³					1.7	4.7	1.9	1.6	1.6 J	3.2		
Total Xylenes	ug/m³	3,500	10,000	15,000	44,000	2.43 J	6.7	2.68	2.25 J	2.24 J	5		

^{-- =} not applicable; no criteria available

ND = not detected

RML = risk management level

RSL = regional screening level

SS = subslab sample

VISL = vapor intrusion screening level

 $\mu g/m^3 = micrograms per cubic meter$

Detected results are bolded.

Highlighted results exceed the Residential or Commercial Soil Gas VISL. a or a*

<u>Underlined results exceed the Residential or Commercial Soil Gas RML Equivalent.</u> bor b*

^a The EPA Soil Gas VISLs were calculated using the EPA VISL Calculator Version 3.5.1, (June 2017 RSLs) based on a target cancer risk of 10^{-5} and a target hazard quotient of 1.

^b The EPA Soil Gas RMLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a target cancer risk of 10^{-4} and a target hazard quotient of 3, with the exception of trichloroethene which is based on a target hazard quotient of 1.

^cProperty 5 was previously identified as the commercial property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

^dProperty 6 was previously identified as the residental property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

Table 5. Subslab Gas Sampling Results - August 2016 to June 2017

			Residential Soil		Commercial Soil	I Soil Property 5 (Commercial) ^c							
		Residential	Gas RML	Commercial Soil	Gas RML	SER-SS-01-0816	SER-SS-01-1116	SER-SS-02-0816	SER-SS-02-1116	SER-SS-03-0816	SER-SS-03-1116		
Compound	Units	Soil Gas VISL ^a	Equivalent ^b	Gas VISL ^{a*}	Equivalent ^{b*}	8/17/2016	11/29/2016	8/17/2016	11/29/2016	8/17/2016	11/29/2016		
1,1,1-Trichloroethane	ug/m ³	170,000	520,000	730,000	2,200,000	110	480	800	350	350	330		
1,1,2-Trichloroethane	ug/m³	7	21	29	88	0.78 U	0.66 U	0.93 U	0.86 U	0.9 U	0.85 U		
1,1-Dichloroethane	ug/m³	580	5,800	2,600	26,000	29	170	0.93 U	0.47 J	160	170		
1,1-Dichloroethene	ug/m³	7,000	21,000	29,000	88,000	25	340	4.2	4.9	130	180		
1,2-Dichloroethane	ug/m³	36	360	160	1,600	51	0.66 U	5.1	0.86 U	0.73 J	0.85 U		
Benzene	ug/m ³	120	1,200	520	5,200	0.72 J	0.64 J	0.93 U	0.86 U	0.55 J	0.85 U		
cis-1,2-Dichloroethene	ug/m ³					1.6	6	0.93 U	0.86 U	14	13		
Ethylbenzene	ug/m ³	370	3,700	1,600	16,000	0.68 J	0.4 J	0.37 J	0.86 U	0.41 J	0.28 J		
Methylene Chloride	ug/m ³	21,000	63,000	88,000	260,000	5.8	0.66 U	0.68 J	0.86 U	0.9 U	0.85 U		
Tetrachloroethene	ug/m ³	1,400	4,200	5,800	18,000	110	78	590	190	250	120		
Toluene	ug/m ³	170,000	520,000	730,000	2,200,000	22	1.3	2.7	0.6 J	2	0.98		
trans-1,2-Dichloroethene	ug/m ³					0.66 J	1.9	0.93 U	0.86 U	2	2		
Trichloroethylene	ug/m³	70	70	290	290	200	150	94	26	<u>440</u>	190		
Vinyl Chloride	ug/m³	56	560	930	9,300	0.78 U	0.28 J	0.93 U	0.86 U	0.9 U	0.39 J		
Xylene, o	ug/m³					0.66 J	0.8	0.49 J	0.35 J	0.77 J	0.5 J		
Xylenes, m & p	ug/m ³					1.7	1.7	1.2 J	0.8 J	1.5 J	1.2 J		
Total Xylenes	ug/m³	3,500	10,000	15,000	44,000	2.36 J	2.5	1.69 J	1.15 J	2.27 J	1.7 J		

-- = not applicable; no criteria available

ND = not detected

RML = risk management level

RSL = regional screening level

SS = subslab sample

VISL = vapor intrusion screening level

 $\mu g/m^3 = micrograms per cubic meter$

Detected results are bolded.

Highlighted results exceed the Residential or Commercial Soil Gas VISL. a or a*

<u>Underlined results exceed the Residential or Commercial Soil Gas RML Equivalent.</u> borb*

^a The EPA Soil Gas VISLs were calculated using the EPA VISL Calculator Version 3.5.1, (June 2017 RSLs) based on a target cancer risk of 10^{-5} and a target hazard quotient of 1.

^b The EPA Soil Gas RMLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a target cancer risk of 10^{-4} and a target hazard quotient of 3, with the exception of trichloroethene which is based on a target hazard quotient of 1.

^cProperty 5 was previously identified as the commercial property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

^dProperty 6 was previously identified as the residental property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

Table 5. Subslab Gas Sampling Results - August 2016 to June 2017

			Residential Soil		Commercial Soil		Property 6 (Residental) ^d							
		Residential	Gas RML	Commercial Soil	Gas RML	SER-SS-04-0816	SER-SS-04-1116	SER-SS-04-062017	SER-SS-05-0816	SER-SS-05-0816-FD	SER-SS-05-1116	SER-SS-05-1116-FD	SER-SS-05-062017	
Compound	Units	Soil Gas VISL ^a	Equivalent ^b	Gas VISL ^{a*}	Equivalent ^{b*}	8/17/2016	11/29/2016	6/10/2017	8/17/2016	8/17/2016	11/29/2016	11/29/2016	6/10/2017	
1,1,1-Trichloroethane	ug/m³	170,000	520,000	730,000	2,200,000	13,000	70	160	30,000	31,000	4.8	4.6	350	
1,1,2-Trichloroethane	ug/m³	7	21	29	88	92 U	0.83 U	0.95 U	170 U	170 U	0.81 U	0.86 U	1.1 U	
1,1-Dichloroethane	ug/m³	580	5,800	2,600	26,000	92 U	0.83 U	0.95 U	380	390	0.41 J	0.41 J	4.8	
1,1-Dichloroethene	ug/m³	7,000	21,000	29,000	88,000	47 J	0.84	7.7	190	190	0.81 U	0.86 U	63	
1,2-Dichloroethane	ug/m³	36	360	160	1,600	92 U	0.83 U	0.95 U	170 U	170 U	0.45 J	0.45 J	1.1 U	
Benzene	ug/m³	120	1,200	520	5,200	92 U	0.83 U	0.95 U	170 U	170 U	0.3 J	0.3 J	1.1 U	
cis-1,2-Dichloroethene	ug/m³					92 U	0.83 U	0.95 U	170 U	170 U	0.81 U	0.86 U	0.41 J	
Ethylbenzene	ug/m³	370	3,700	1,600	16,000	92 U	0.86	0.56 J	170 U	170 U	0.36 J	0.39 J	0.74 J	
Methylene Chloride	ug/m³	21,000	63,000	88,000	260,000	92 U	0.83 U	0.95 U	170 U	170 U	0.95	0.94	1.1 U	
Tetrachloroethene	ug/m³	1,400	4,200	5,800	18,000	34 J	6.5	3.8	130 J	120 J	0.41 J	0.57 J	8.9	
Toluene	ug/m³	170,000	520,000	730,000	2,200,000	92 U	2.9	2.3	170 U	170 U	1.3	1.6	2.6	
trans-1,2-Dichloroethene	ug/m³					92 U	0.83 U	0.95 U	170 U	170 U	0.81 U	0.86 U	1.1 U	
Trichloroethylene	ug/m³	70	70	290	290	92 U	1.4	1.8	<u>120</u> <u>J</u>	<u>120</u> <u>J</u>	0.29 J	0.3 J	26	
Vinyl Chloride	ug/m³	56	560	930	9,300	92 U	0.83 U	0.95 U	170 U	170 U	0.81 U	0.86 U	1.1 U	
Xylene, o	ug/m³					92 U	1.6	0.98	170 U	170 U	0.7 J	0.71 J	1.2	
Xylenes, m & p	ug/m³					180 U	3.6	2.2	330 U	340 U	1.6 J	1.7 J	2.8	
Total Xylenes	ug/m³	3,500	10,000	15,000	44,000	ND	5.2	3.18	ND	ND	2.3 J	2.41 J	4	

^{-- =} not applicable; no criteria available

ND = not detected

RML = risk management level

RSL = regional screening level

SS = subslab sample

VISL = vapor intrusion screening level

 $\mu g/m^3 = micrograms per cubic meter$

Detected results are bolded.

Highlighted results exceed the Residential or Commercial Soil Gas VISL. a or a*

<u>Underlined results exceed the Residential or Commercial Soil Gas RML Equivalent.</u> borb*

 $^{^{\}rm a}$ The EPA Soil Gas VISLs were calculated using the EPA VISL Calculator Version 3.5.1, (June 2017 RSLs) based on a target cancer risk of 10^{-5} and a target hazard quotient of 1.

^b The EPA Soil Gas RMLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a target cancer risk of 10^{-4} and a target hazard quotient of 3, with the exception of trichloroethene which is based on a target hazard quotient of 1.

^cProperty 5 was previously identified as the commercial property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

^dProperty 6 was previously identified as the residental property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

Table 6. Indoor and Crawlspace Air Sampling Results - August 2016 to June 2017

					Commercial		Property 3 (Residental)	
Commenced			Residential Indoor		Indoor Air	SER-IA-05-0217	SER-IA-05-062017	SER-IA-06-0217	SER-IA-06-062017
Compound		Residential	Air RML	Commercial	RML	Basement	Basement	1st Floor	1st Floor
	Units	Indoor Air VISL ^a	Equivalent ^b	Indoor Air VISL ^{a*}	Equivalent ^{b*}	2/23/2017	6/8/2017	2/23/2017	6/8/2017
1,1,1-Trichloroethane	ug/m³	5,200	16,000	22,000	66,000	0.026 J	0.11	0.021 J	0.088 J
1,1,2-Trichloroethane	ug/m³	0.21	0.63	0.88	2.6	0.17 U	0.24 U	0.17 U	0.44 U
1,1-Dichloroethane	ug/m³	18	180	77	770	0.011 J	0.024 J	0.011 J	0.11 U
1,1-Dichloroethene	ug/m³	210	630	880	2,600	0.042 U	0.12	0.042 U	0.07 J
1,2-Dichloroethane	ug/m³	1.1	11	4.7	47	4	6.9	9	9.6
Benzene	ug/m³	3.6	36	16	160	2.6	5	3.7	6.4
cis-1,2-Dichloroethene	ug/m³					0.042 U	0.024 J	0.042 U	0.11 U
Ethylbenzene	ug/m³	11	110	49	490	2.9	3.9	4.7	5.6
Methylene Chloride	ug/m³	630	1,900	2,600	7,900	0.82	1.1	1.3	1.2
Tetrachloroethene	ug/m³	42	130	180	530	0.46	0.88	0.73	0.98
Toluene	ug/m³	5,200	16,000	22,000	66,000	13	22	21	29
trans-1,2-Dichloroethene	ug/m³					0.042 U	0.037 J	0.014 J	0.033 J
Trichloroethylene	ug/m³	2.1	2.1	8.8	8.8	0.22 J	0.68	0.65 J	0.81
Vinyl Chloride	ug/m ³	1.7	17	28	280	0.042 U	0.06 U	0.042 U	0.11 U
Xylene, o	ug/m³					4 J	5.3	6.5 J	7.5
Xylenes, m & p	ug/m³					9.9	12	16	18
Total Xylenes	ug/m ³	100	310	440	1,300	13.9 J	17.3	22.5 J	25.5

^{-- =} not applicable; no criteria available

ND = not detected

IA = indoor air sample

CS = crawlspace air sample

RML = risk management level

RSL = regional screening level

VISL = vapor intrusion screening level

μg/m³ = micrograms per cubic meter

Detected results are bolded.

Highlighted results exceed the Residential or Commercial Indoor Air VISL. a or a*

Underlined results exceed the Residential or Commercial Indoor Air RML Equivalent. b or b*

target cancer risk of 10^4 and a target hazard quotient of 3, with the exception of trichloroethene which is based on

a target hazard quotient of 1.

^cProperty 5 was previously identified as the commercial property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

^dProperty 6 was previously identified as the residental property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

UJ = The analyte was not detected; however, the result is estimated because of discrepancies in meeting certain analyte-specific QC.

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 $^{^{\}rm a}$ The EPA Indoor Air VISLs were calculated using the EPA VISL Calculator 3.5.1 (June 2017 RSLs) based on a target cancer risk of 10^{-5} and target hazard quotient of 1.

 $^{^{\}rm b}$ The EPA Indoor Air RMLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a

Table 6. Indoor and Crawlspace Air Sampling Results - August 2016 to June 2017

Southeast Nockjora Groundwater Contain	-	, ,			Commercial		P	roperty 4 (Residental)		Property 5 (Commercial) ^c
S			Residential Indoor		Indoor Air	SER-IA-07-0217	SER-IA-07-0217-FD	SER-IA-07-062017	SER-IA-08-0217	SER-IA-08-062017	SER-IA-01-0816	SER-IA-02-0816
Compound		Residential	Air RML	Commercial	RML	Basement	Basement	Basement	1st Floor	1st Floor	1st Floor	1st Floor
	Units	Indoor Air VISL ^a	Equivalent ^b	Indoor Air VISL ^{a*}	Equivalent ^{b*}	2/23/2017	2/23/2017	6/8/2017	2/23/2017	6/8/2017	8/17/2016	8/17/2016
1,1,1-Trichloroethane	ug/m³	5,200	16,000	22,000	66,000	0.022 J	0.023 J	0.1	0.021 J	0.1	0.12	0.12
1,1,2-Trichloroethane	ug/m³	0.21	0.63	0.88	2.6	0.15 U	0.16 U	0.21 U	0.16 U	0.22 U	0.17 U	0.17 U
1,1-Dichloroethane	ug/m³	18	180	77	770	0.017 J	0.015 J	0.025 J	0.019 J	0.019 J	0.033 J	0.035 J
1,1-Dichloroethene	ug/m³	210	630	880	2,600	0.038 U	0.039 U	0.053 U	0.04 U	0.056 U	0.016 J	0.016 J
1,2-Dichloroethane	ug/m³	1.1	11	4.7	47	1.4	1.5	2.3	2.2	3.5	0.058	0.18
Benzene	ug/m³	3.6	36	16	160	0.77	0.77 J	0.84	0.81 J	0.72	0.57	0.63
cis-1,2-Dichloroethene	ug/m³					0.038 U	0.039 U	0.021 J	0.04 U	0.024 J	0.017 J	0.017 J
Ethylbenzene	ug/m³	11	110	49	490	0.72	0.66	0.74	0.5	1.2	0.5	0.82
Methylene Chloride	ug/m³	630	1,900	2,600	7,900	0.72 J	0.51 J	0.42	0.54	0.78	0.23	0.39
Tetrachloroethene	ug/m³	42	130	180	530	0.29	0.31	0.36	0.35	0.4	0.23	0.25
Toluene	ug/m³	5,200	16,000	22,000	66,000	3.6	3.5	7	3.3	9.1	4.3	5.5
trans-1,2-Dichloroethene	ug/m³					0.038 U	0.039 U	0.035 J	0.04 U	0.037 J	0.043 U	0.042 U
Trichloroethylene	ug/m³	2.1	2.1	8.8	8.8	0.017 J	0.018 J	0.28	0.017 J	0.62	0.2	0.2
Vinyl Chloride	ug/m³	1.7	17	28	280	0.038 U	0.039 U	0.053 U	0.04 U	0.056 U	0.043 U	0.042 U
Xylene, o	ug/m³					0.6 J	0.53	0.81	0.5	1.5	0.56	0.75
Xylenes, m & p	ug/m³					1.8	1.5	1.9	1.3	3.4	1.5	2.1
Total Xylenes	ug/m³	100	310	440	1,300	2.4 J	2.03	2.71	1.8	4.9	2.06	2.85

^{-- =} not applicable; no criteria available

ND = not detected

IA = indoor air sample

CS = crawlspace air sample

RML = risk management level

RSL = regional screening level

VISL = vapor intrusion screening level

μg/m³ = micrograms per cubic meter **Detected results are bolded.**

Highlighted results exceed the Residential or Commercial Indoor Air VISL. a or a*

<u>Underlined results exceed the Residential or Commercial Indoor Air RML Equivalent.</u> bor b*

 $^{\rm a}$ The EPA Indoor Air VISLs were calculated using the EPA VISL Calculator 3.5.1 (June 2017 RSLs) based on a target cancer risk of 10^{-5} and target hazard quotient of 1.

^b The EPA Indoor Air RMLs were calculated using the EPA VISL Calculator Version 3.5.1 (June 2017 RSLs) based on a

target cancer risk of 10⁻⁴ and a target hazard quotient of 3, with the exception of trichloroethene which is based on

a target hazard quotient of 1.

^cProperty 5 was previously identified as the commercial property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

^dProperty 6 was previously identified as the residental property in the Uniform Federal Policy Quality Assurance Project Plan Addendum II (CH2M 2016b)

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

UJ = The analyte was not detected; however, the result is estimated because of discrepancies in meeting certain analyte-specific QC.

Table 7. Outdoor Air Sampling Results - August 2016 to June 2017

			Property 3 (F	Residental)		Property 4 (Residental) Property 5 (Commercial) ^a			Property 6 (Residental) ^b					
Compound	Units	SER-OA-03-0217	SER-OA-03-0217-FD	SER-OA-03-062017	ER-OA-03-062017-F	SER-OA-04-0217	SER-OA-04-062017	SER-OA-02-0816	SER-OA-02-1116	SER-OA-01-0816	SER-OA-01-0816-FD	SER-OA-01-1116	SER-OA-01-1116-FD	SER-OA-01-062017
		2/23/2017	2/23/2017	6/8/2017	6/8/2017	2/23/2017	6/8/2017	8/17/2016	11/29/2016	8/17/2016	8/17/2016	11/29/2016	11/29/2016	6/10/2017
1,1,1-Trichloroethane	ug/m³	0.023 J	0.023 J	0.14	0.13	0.023 J	0.14	0.06	0.014 J	0.34	0.36	0.022 J	0.022 J	0.037 J
1,1,2-Trichloroethane	ug/m³	0.16 U	0.15 U	0.14 U	0.23 U	0.15 U	0.22 U	0.18 U	0.16 U	0.17 U	0.17 U	0.15 U	0.16 U	0.17 U
1,1-Dichloroethane	ug/m³	0.0097 J	0.01 J	0.02 J	0.019 J	0.01 J	0.018 J	0.045 U	0.04 U	0.062	0.062	0.032 J	0.033 J	0.017 J
1,1-Dichloroethene	ug/m³	0.039 U	0.038 U	0.036 U	0.057 U	0.039 U	0.056 U	0.045 U	0.04 U	0.043 U	0.042 U	0.023 J	0.024 J	0.044 U
1,2-Dichloroethane	ug/m³	0.058	0.059	0.053 J	0.091 J	0.06	0.059	0.47	0.074	8.1	0.062	0.093	0.094	0.051
Benzene	ug/m³	0.53	0.55	0.3 J	0.47 J	0.49 J	0.29	0.29	0.45	0.93	0.57	0.4	0.4	0.42
cis-1,2-Dichloroethene	ug/m³	0.039 U	0.038 U	0.015 J	0.057 U	0.039 U	0.045 J	0.045 U	0.04 U	0.043 U	0.042 U	0.038 U	0.039 U	0.044 U
Ethylbenzene	ug/m³	0.14 J	0.14 J	0.23 J	1.1 J	0.14 J	0.56	0.17 J	0.16	1.3	0.62	0.15 J	0.14 J	0.47
Methylene Chloride	ug/m³	0.32	0.33	0.3 J	0.68 J	0.34	0.37	0.27	0.25	2.1	0.54	0.6	0.63	0.42
Tetrachloroethene	ug/m³	0.074	0.066	0.17 J	0.25 J	0.061	0.19	0.46	0.044	0.75	0.76	0.078	0.08	0.16
Toluene	ug/m³	0.78	0.79	1.4 J	5.5 J	0.8	2.4	1.6	1.1	27	3	1	1	2.4
trans-1,2-Dichloroethene	ug/m³	0.022 J	0.021 J	0.011 J	0.023 J	0.039 U	0.021 J	0.045 U	0.04 U	0.081	0.042 U	0.038 U	0.039 U	0.044 U
Trichloroethylene	ug/m³	0.029 J	0.038 U	0.56	0.53	0.039 U	0.55	0.045 U	0.04 U	0.088	0.022 J	0.036 J	0.039 U	0.058
Vinyl Chloride	ug/m³	0.039 U	0.038 U	0.036 U	0.057 U	0.039 U	0.056 U	0.045 U	0.04 U	0.043 U	0.042 U	0.038 U	0.039 U	0.044 U
Xylene, o	ug/m³	0.17 J	0.16 J	0.31 J	1.7 J	0.16	0.91	0.19	0.16	1.3	0.87	0.21	0.19	0.64
Xylenes, m & p	ug/m³	0.43	0.43	0.69 J	3.3 J	0.42	1.7	0.46	0.47	3.5	2.3	0.53	0.51	1.7
Total Xylenes	ug/m³	0.6 J	0.59 J	1 J	5 J	0.58	2.61	0.65	0.63	4.8	3.17	0.74	0.7	2.34

OA = outdoor air sample

μg/m³ = micrograms per cubic meter

Detected results are bolded.

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

Table 8. Helium Sampling Results - August 2016

			SER-SG-80
Compound	Units	SER-SG-80-0816	
			8/18/2016
Helium		ppmv	90

Note: A helium sample was collected at SG-80 during August 2016 sampling because it failed the helium-leak test, and methane interference was suspected.

SG = deep soil gas sample ppmv = parts per million by volume

Detected results are bolded.

Figures



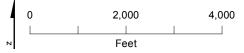


Figure 1 Site Location Southeast Rockford Groundwater Contamination Superfund Site Rockford, IL

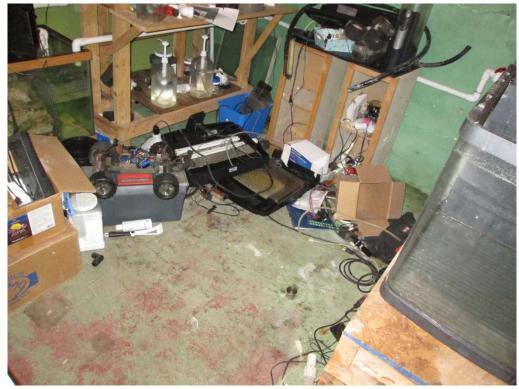
non-responsive

non-responsive

non-responsive

Attachment 1 Photographic Log

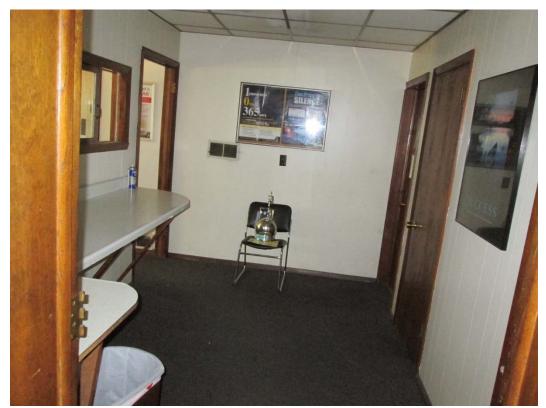
Photographic Log



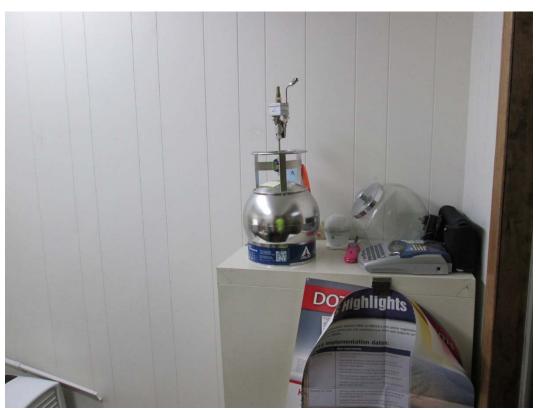
Photograph 001: Completed subslab probe SER-SS-05 at the residential property sampled in August 2016.



Photograph 002: Subslab sampling canister set up at the commercial property sampled in August 2016.



Photograph 003: Indoor air sampling location set-up at the commercial property sampled in August 2016.



Photograph 004: Indoor air sampling location set-up at the commercial property sampled in August 2016.



Photograph 005: Outdoor air sampling location set-up at the commercial property sampled in August 2016.



Photograph 006: Proposed location for exterior soil gas probe SG-77.



Photograph 007: Marking utility locations at exterior soil gas probe location SG-81.



Photograph 008: Installation of exterior soil gas probe at SG-78.



Photograph 009: Soil cores collected from exterior soil gas probe location SG-75.



Photograph 010: Soil cores collected from exterior soil gas probe location SG-77.



Photograph 011: Soil cores collected from exterior soil gas probe location SG-79.



Photograph 012: Completed exterior soil gas probe installation at location SG-81, awaiting completion with concrete pad.



Photograph 013: Completed concrete pad at exterior soil gas probe location SG-81.



Photograph 014: Completed exterior soil gas probe location SG-78.

Attachment 2 Soil Boring Logs



PROJECT NUMBER:	BORING NUMBER:					
678601	SB-75	SHEET	1	OF	1	

PROJECT : SE Rockford Groundwater Contamination Superfund Site	PROJECT LOCATION: Rockford, Illinois

ELEVATION: Not Measured DRILLING CONTRACTOR: Terra Probe Environmental DRILLING EQUIPMENT AND METHOD: Geoprobe 6610DT LOGGER: WATER LEVELS : 7.5 START: 8/12/16 12:05 END: 8/12/16 12:20 **EDITOR** DEPTH BELOW EXISTING GRADE (ft) SOIL DESCRIPTION COMMENTS SYMBOLIC LOG INTERVAL (ft) DEPTH OF CASING, DRILLING RATE, SOIL NAME, USCS GROUP SYMBOL, COLOR, RECOVERY (ft) DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY #TYPE 0.0'-2.4' SILTY TOPSOIL (ML) - moist, soft, black 0.0 PID: 0.0 ppm PID: 0.0 ppm 2.4 MC - 1 2.4'-5.0' No Recovery 5 5.0 5.0'-8.0' SILT (ML) - moist, soft, brownish tan PID: 0.0 ppm PID: 0.0 ppm PID: 0.0 ppm MC - 2 3.0 Saturated at 7.5' bgs 8.0'-10.0' No Recovery PID: 0.0 ppm 10 10.0 10.0'-13.1' SILT (ML) - saturated, soft, brownish tan PID: 0.0 ppm PID: 0.0 ppm PID: 0.0 ppm MC - 3 3.1 PID: 0.0 ppm 13.1'-15.0' No Recovery 15 15.0 End of Boring at 15.0' bgs Abbreviations: Saturated Conditions Encountered at 7.5' bgs HC - Hand Auger Core MC - DPT Macro Core 20



PROJECT NUMBER:	BORING NUMBER:					
678601	SB-77	SHEET	1	OF	1	

PROJECT : SE Rockford Groundwater Contamination Superfund Site PROJECT LOCATION: Rockford, Illinois

ELEVATION: Not Measured DRILLING CONTRACTOR: Terra Probe Environmental

DRILLING EQUIPMENT AND METHOD: Geoprobe 6610DT LOGGER: WATER LEVELS : 21.9 START: 8/12/16 09:25 END: 8/12/16 10:30 **EDITOR** DEPTH BELOW EXISTING GRADE (ft) SOIL DESCRIPTION COMMENTS SYMBOLIC LOG INTERVAL (ft) SOIL NAME, USCS GROUP SYMBOL, COLOR, DEPTH OF CASING, DRILLING RATE, RECOVERY (ft) MOISTURE CONTENT, RELATIVE DENSITY OR DRILLING FLUID LOSS, TESTS, AND CONSISTENCY, SOIL STRUCTURE, MINERALOGY INSTRUMENTATION #TYPE 0.0'-0.8' SILTY TOPSOIL (ML) - moist, soft, brown, some 0.0 0.8'-2.1' LEAN CLAY (CL) - moist, soft, black to brown, trace PID: 0.0 ppm 2.1 MC - 1 PID: 0.0 ppm 2.1'-4.0' No Recovery 4.0 4.0'-6.1' SANDY CLAY (CL) - moist, soft, brown, trace gravel, PID: 0.0 ppm 5 trace silt PID: 0.0 ppm 2.1 MC - 2 very sandy at 5.9' bgs PID: 0.0 ppm 6.1'-8.0' No Recovery 8.0 8.0'-8.5' CLAYEY SAND (SC) to SANDY CLAY (CL) - moist, PID: 0.0 ppm firm. brown 8.5'-10.4' SANDY CLAY (CL) - moist, firm, brown, trace PID: 0.0 ppm gravel, with mottles 10 2.4 MC - 3 PID: 0.0 ppm 10.4'-12.0' No Recovery 12.0 12.0'-15.8' LEAN CLAY (CL) - moist, firm to stiff, grayish PID: 0.0 ppm brown, trace gravel, trace sand sandy at 12.0 and 12.4' bgs PID: 0.0 ppm MC - 4 3.8 PID: 0.0 ppm 15 PID: 0.0 ppm 16.0 15.8'-16.0' No Recovery PID: 0.0 ppm 16.0'-19.8' POORLY GRADED SAND (SP) - dry, loose, brown, with gravel PID: 0.0 ppm rust mottles from 17.4'-18.3' bgs MC - 5 3.8 PID: 0.0 ppm PID: 0.0 ppm 20 20.0 19.8'-20.0' No Recovery PID: 0.0 ppm 20.0'-22.7' POORLY GRADED SAND (SP) - dry, loose, brown, with gravel PID: 0.0 ppm gravelly at 20.9' bgs MC - 6 wet at 21.9' bgs 43 PID: 0.0 ppm 22.7'-23.6' LEAN CLAY (CL) - moist, hard, gravelly, mottled PID: 0.0 ppm 23.6'-24.3' POORLY GRADED SAND (SP) - moist to wet, 24.3 PID: 0.0 ppm dense, brown, with gravel, mottled Abbreviations: 25 End of Boring at 24.3' bgs HC - Hand Auger Core MC - DPT Macro Core Saturated Conditions Encountered at 21.9' bas 30



PROJECT NUMBER:	BORING NUMBER:					-
678601	SB-78	SHEET	1	OF	1	

PROJECT : SE Rockford Groundwater Contamination Superfund Site PROJECT LOCATION: Rockford, Illinois

ELEVATION: Not Measured DRILLING CONTRACTOR: Terra Probe Environmental DRILLING EQUIPMENT AND METHOD: 2.0" O.D. Hand Auger LOGGER: WATER LEVELS : N/A START: 8/11/16 09:56 END: 8/11/16 10:50 **EDITOR** DEPTH BELOW EXISTING GRADE (ft) SOIL DESCRIPTION COMMENTS SYMBOLIC LOG INTERVAL (ft) SOIL NAME, USCS GROUP SYMBOL, COLOR, DEPTH OF CASING, DRILLING RATE, RECOVERY (ft) MOISTURE CONTENT, RELATIVE DENSITY OR DRILLING FLUID LOSS, TESTS, AND CONSISTENCY, SOIL STRUCTURE, MINERALOGY INSTRUMENTATION #TYPE 0.0'-1.0' SILTY TOPSOIL (ML) - moist, black, trace clay, 0.0 some roots 1.0'-6.5' LEAN CLAY (CL) - moist, black, trace sand, trace silt PID: 0.0 ppm PID: 0.0 ppm PID: 0.0 ppm PID: 0.0 ppm 5 PID: 0.0 ppm 11.6 HC - 1 turns brownish black at 6.0' bgs PID: 0.0 ppm 6.5'-8.0' LEAN CLAY (CL) - moist, brown, silty, trace sand sand content increases with depth PID: 0.0 ppm 8.0'-10.0' SANDY CLAY (CL) interbedded with CLAYEY PID: 0.0 ppm SAND (SC) - moist, brown, trace silt PID: 0.0 ppm 10 10.0'-10.9' - GRAVELLY SAND (SP) - moist, brown, clayey, PID: 0.0 ppm with coarse gravel switched to 2" O.D. Hand Auger O. 10.9'-11.6' POORLY GRADED FINE SAND - moist, brown, PID: 0.0 ppm trace gravel Interbedded with sandy clay with gravel 11.6 Abbreviations: HC - Hand Auger Core MC - DPT Macro Core End of Hand Auger at 11.6' bgs (refusal on rock) Saturated Conditions Not Encountered 15



PROJECT NUMBER:	BORING NUMBER:					_
678601	SB-79	SHEET	1 0	F	1	

PROJECT : SE Rockford Groundwater Contamination Superfund Site PROJECT LOCATION: Rockford, Illinois

ELEVATION: Not Measured DRILLING CONTRACTOR: Terra Probe Environmental

DRILLING EQUIPMENT AND METHOD: Geoprobe 6610DT LOGGER: WATER LEVELS : \(\brace 21.0 \) START: 8/12/16 09:45 END: 8/12/16 11:45 **EDITOR** DEPTH BELOW EXISTING GRADE (ft) SOIL DESCRIPTION COMMENTS SYMBOLIC LOG INTERVAL (ft) SOIL NAME, USCS GROUP SYMBOL, COLOR, DEPTH OF CASING, DRILLING RATE, RECOVERY (ft) MOISTURE CONTENT, RELATIVE DENSITY OR DRILLING FLUID LOSS, TESTS, AND CONSISTENCY, SOIL STRUCTURE, MINERALOGY INSTRUMENTATION #TYPE 0.0'-1.4' SILTY TOPSOIL (ML) - dry, firm, dark brown, sandy, 0.0 trace gravel, roots PID: 0.0 ppm 1.4'-19.0' SILT (ML) - dry, brown, clayey, trace sand, trace fine angular gravel PID: 0.0 ppm MC - 1 5.0 PID: 0.0 ppm PID: 0.0 ppm 5 5.0 PID: 0.0 ppm gravelly from 5.9'-6.2' bgs PID: 0.0 ppm PID: 0.0 ppm MC - 2 5.0 very sandy from 7.5'-7.7' bgs gravelly from 7.8'-8.1' bgs PID: 0.0 ppm PID: 0.0 ppm 10 10.0 PID: 0.0 ppm PID: 0.0 ppm 3.0 MC - 3 PID: 0.0 ppm gravelly at 12.5' bgs 13.0 PID: 0.0 ppm PID: 0.0 ppm MC - 4 3.0 15 gravelly at 15.0' bgs PID: 0.0 ppm 16.0 PID: 0.0 ppm PID: 0.0 ppm 3.0 MC - 5 PID: 0.0 ppm 19.0 19.0'-22.0' SILT (ML) - dry, brown, some fine sand, trace PID: 0.0 ppm gravel 20 PID: 0.0 ppm MC - 6 3.0 wet at 21.0' bgs PID: 0.0 ppm PID: 0.0 ppm 22.0 End of Boring at 22.0' bgs Abbreviations: HC - Hand Auger Core MC - DPT Macro Core Saturated Conditions Encountered at 21.0' bgs 25



PROJECT NUMBER:	BORING NUMBER:					
678601	SB-80	SHEET	1	OF	1	

PROJECT : SE Rockford Groundwater Contamination Superfund Site PROJECT LOCATION: Rockford, Illinois

DRILLING CONTRACTOR: Terra Probe Environmental ELEVATION: Not Measured DRILLING EQUIPMENT AND METHOD: 2.5" O.D. Hand Auger, Geoprobe 6610DT LOGGER: WATER LEVELS : 13.6 START: 8/11/16 14:00 END: 8/12/16 09:25 **EDITOR** DEPTH BELOW EXISTING GRADE (ft) SOIL DESCRIPTION COMMENTS SYMBOLIC LOG INTERVAL (ft) SOIL NAME, USCS GROUP SYMBOL, COLOR, DEPTH OF CASING, DRILLING RATE, RECOVERY (ft) MOISTURE CONTENT, RELATIVE DENSITY OR DRILLING FLUID LOSS, TESTS, AND CONSISTENCY, SOIL STRUCTURE, MINERALOGY INSTRUMENTATION #TYPF 0.0'-2.0' SILTY TOPSOIL (ML) - dry, soft, black, some sand 0.0 PID: 0.0 ppm 2.0'-4.0' SANDY LEAN CLAY (CL) - moist, soft, brownish PID: 0.0 ppm black, some silt color changing to brown depth PID: 0.0 ppm 4.0'-7.0' SANDY LEAN CLAY (CL) - moist, firm, brown PID: 0.0 ppm 5 10.0 HC - 1 PID: 0.0 ppm very sandy at 6.0' bgs PID: 0.0 ppm 7.0'-10.0' CLAYEY SAND (SC) - moist, brown, gravelly PID: 0.0 ppm PID: 0.0 ppm PID: 0.0 ppm 10 10.0 10.0'-10.8' POORLY GRADED SAND with CLAY (SP-SC) -Hand Auger refusal on rock, switch to Geoprobe, PID: 0.0 ppm moist, brown, gravelly, trace clay 10.8'-11.3' LEAN CLAY (CL) - moist, firm, brown, gravelly, PID: 0.0 ppm trace sand 11.3'-14.0' WELL GRADED SAND (SW) - moist, firm, brown, trace gravel, trace clay PID: 0.0 ppm 4.0 MC - 1 PID: 0.0 ppm saturated at 13.6' bgs 14.0'-15.0' No Recovery 15 15.0 15.0'-16.9' SILT (ML) - saturated, stiff, brown, trace clay PID: 0.0 ppm PID: 0.0 ppm 16.9'-17.7' CLAYEY SAND (SC) - saturated, firm, brown, PID: 0.0 ppm 5.0 MC - 2 17.7'-18.8' LEAN CLAY (CL) - stiff, reddish brown, trace PID: 0.0 ppm 18.8'-20.0' CLAYEY SAND (SC) - saturated, stiff, brown, PID: 0.0 ppm trace gravel clay layer from 19.1'19.3' bgs 20 PID: 0.0 ppm 20.0 End of Boring at 20.0' bgs Abbreviations: Saturated Conditions Encountered at 13.6' bgs HC - Hand Auger Core MC - DPT Macro Core 25



PROJECT NUMBER:	BORING NUMBER:					-
678601	SB-81	SHEET	1	OF	1	

	PROJECT : SE Rockford Groundwater Contamination Superfund Site	PROJECT LOCATION: Rockford, Illinois
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ELEVATION: Not Measured DRILLING CONTRACTOR: Terra Probe Environmental DRILLING EQUIPMENT AND METHOD: 2.5" O.D. Hand Auger LOGGER WATER LEVELS : \(\brace{\texts} \) 9.5 START: 8/11/16 07:50 END: 8/11/16 09:00 **EDITOR** DEPTH BELOW EXISTING GRADE (ft) SOIL DESCRIPTION COMMENTS SYMBOLIC LOG INTERVAL (ft) SOIL NAME, USCS GROUP SYMBOL, COLOR, DEPTH OF CASING, DRILLING RATE, RECOVERY (ft) MOISTURE CONTENT, RELATIVE DENSITY OR DRILLING FLUID LOSS, TESTS, AND CONSISTENCY, SOIL STRUCTURE, MINERALOGY INSTRUMENTATION #TYPE 0.0'-1.5' SILTY TOPSOIL (ML) - dry, black, trace sand, roots 0.0 PID: 0.0 ppm 1.5'-4.0' LEAN CLAY (CL) - moist, black, silty, trace sand color changing to brown depth PID: 0.0 ppm PID: 0.0 ppm 4.0'-6.5' LEAN CLAY (CL) - moist, brown to tan, trace gravel PID: 0.0 ppm 5 10.2 HC - 1 PID: 0.0 ppm sandy at 5.0' bgs PID: 0.0 ppm very sandy at 6.5' bgs 6.5'-7.5' FINE SANDY CLAY (SC) - moist, brown PID: 0.0 ppm 7.5'-8.0' POORLY GRADED FINE SAND (SP) - moist, brown 8.0'-8.5' LEAN CLAY (CL) - moist, brown, sandy PID: 0.0 ppm 8.5'-10.2' WELL GRADED SAND (SW) - moist, brown interbedded with sandy lean clay PID: 0.0 ppm saturated at 9.5' bgs 10 10.2 PID: 0.0 ppm Abbreviations: HC - Hand Auger Core MC - DPT Macro Core End of Hand Auger at 10.2' bgs (refusal) Saturated Conditions Encountered at 9.5' bgs 15



PROJECT NUMBER:	BORING NUMBER:					
678601	SB-82	SHEET	1	OF	1	

PROJECT : SE Rockford Groundwater Contamination Superfund Site PROJECT LOCATION: Rockford, Illinois

ELEVATION: Not Measured DRILLING CONTRACTOR: Terra Probe Environmental DRILLING EQUIPMENT AND METHOD: 2.5" O.D. Hand Auger LOGGER: WATER LEVELS : N/A START: 8/10/16 13:55 END: 8/10/16 15:30 **EDITOR** DEPTH BELOW EXISTING GRADE (ft) SOIL DESCRIPTION COMMENTS SYMBOLIC LOG INTERVAL (ft) SOIL NAME, USCS GROUP SYMBOL, COLOR, DEPTH OF CASING, DRILLING RATE, RECOVERY (ft) MOISTURE CONTENT, RELATIVE DENSITY OR DRILLING FLUID LOSS, TESTS, AND CONSISTENCY, SOIL STRUCTURE, MINERALOGY INSTRUMENTATION #TYPE 0.0'-1.5' SILTY TOPSOIL (ML) - moist, firm, brownish black 0.0 color lightens with depth PID: 0.0 ppm 1.5'-15.6' LEAN CLAY (CL) - moist, firm, brown, trace gravel PID: 0.0 ppm PID: 0.0 ppm PID: 0.0 ppm sandy with trace gravel at 4.0' bgs 5 some gravel at 5.0' bgs PID: 0.0 ppm large gravel chunk at 6.0' bgs PID: 0.0 ppm PID: 0.0 ppm 15.6 HC - 1 PID: 0.0 ppm gravelly at 9.0' bgs PID: 0.0 ppm 10 PID: 0.0 ppm PID: 0.0 ppm sandy and silty from 12.0'-13.0 bgs PID: 0.0 ppm PID: 0.0 ppm sandy from 14.0'-15.0' bgs PID: 0.0 ppm 15 PID: 0.0 ppm <u>15.</u>6 End of Hand Auger at 15.6' bgs Saturated Conditions not Encountered Abbreviations: HC - Hand Auger Core MC - DPT Macro Core 20

Attachment 3 Soil Gas Probe Construction Logs



PROJECT NUMBER

678601.ET.01

PROBE NUMBER

SHEET 1 OF

SHEET 1 OF 1 DATE:

8/12/2016

SG-74

Soil Gas Probe Installation Form

PROJECT: SE Rockford Groundwater Contamination Superfund Site LOCATION: Rockford, IL

DRILLING CONTRACTOR: Terra Probe Environmental

DRILLING METHOD AND EQUIPMENT USED: Geoprobe 6620DT 2.25 inch outer diameter rods

DRILLING METHOD AND B START: 8/12/2016 12:55			cobe 6620DT 2.25 inch outer diameter rods LOGGER:	
- 1	Ground	Level	Outer Diameter of Boring (in.)	2.25
	Probe Vault	\uparrow	(1) Depth to Bottom of Screen (ft. bgs)	
	<u> </u>		(2)Depth to Top of Sand (ft. bgs)	10.9
	Hydrated Granular Bentonite ————————————————————————————————————		(3)Depth to Top of Dry Granular Bentonite Seal (ft. bgs)	5.9
	ntonite anular Be		(4)Depth of Probe Vault (ft.)	0.8
	Hydrated Granular Bentonite epth to Top of Dry Granular E		(1-2) Length of-Sand (ft.)	0.9
	ated Gra	'	(2-3) Length of Dry Granular Bentonite Seal (ft.)	5.0
	- Hydra	Sand	(3-4) Length of Hydrated Granular Bentonite Seal (ft.)	5.1
		Depth to top of Sand angth of rod)	Screen Diameter (in.) / Length (ft.)	0.5" / 0.5'
<u> </u>		Depth to Bottom of Screen (length of rod)	Screen Mesh (in.)	0.006
		 f Screen	Teflon Tubing Outer Diameter (in.)	0.25
	Seal	Sottom of	Flush Mount Diameter (in.)	6.0
	Bentonit	epth to E	Length of Expendable Tip (ft.)	0.2
	Dry Granular Bentonite Seal		Soil Boring Conducted	No
	Dry G		Sand Backfill (ft. bgs)	2.1
			Specifications (Quantity and Type	<u>e)</u>
	V	*	Sand: Filtration Sand	
III I		Sand	Granular Bentonite Seal: Benseal Sodium Bentonite	
	Screen Length	,	Surface Completion: Flush mount with concrete pad	
	gth Scre	\downarrow \downarrow		
	Length of Capend able Tip			



PROJECT NUMBER PROBE NUMBER SG-75 678601.ET.01 8/12/2016 SHEET 1 OF 1 DATE:

Soil Gas Probe Installation Form

PROJECT: SE Rockford Groundwater Contamination Superfund Site LOCATION: Rockford, IL

DRILLING CONTRACTOR: Terra Probe Environmental

DRILLING METHOD AND EQUIPMENT USED: Geoprobe 6620DT 2.25 inch outer diameter rods

START:	8/12/2016 12:05	END:	8/12/2016	12:35	LOGGER :		
	1		Ground Leve	el	C	Outer Diameter of Boring (in.)	2.25
		Probe Vault				to Bottom of Screen (ft. bgs)	5.8
		<u> </u>	-		(2)[Depth to Top of Sand (ft. bgs)	4.9
			Depth to Top of Dry Granular Bentonite Seal-		(3)Depth to Top of Dry Gra	anular Bentonite Seal (ft. bgs)	3.9
		ntonite	anular Be			(4)Depth of Probe Vault (ft.)	0.8
		ınular Be	f Dry Gre			(1-2) Length of-Sand (ft.)	0.9
		Hydrated Granular Bentonite	to Top of		(2-3) Length of Dry	Granular Bentonite Seal (ft.)	1.0
		- Hydr	-Depth		(3-4) Length of Hydrated	Granular Bentonite Seal (ft.)	3.1
			Depth to top of Sand	of rod)	Scree	en Diameter (in.) / Length (ft.)	0.5" /0.5'
		<u> </u>	Depth	Depth to Bottom of Screen (length of rod)		Screen Mesh (in.)	0.006
			I	of Screen	Teflor	n Tubing Outer Diameter (in.)	0.25
		ite Seal		Bottom c		Flush Mount Diameter (in.)	6.0
		r Benton		Depth to	l	Length of Expendable Tip (ft.)	
		Dry Granular Bentonite Seal		اً		Soil Boring Conducted	Yes
		Dry				Sand Backfill (ft. bgs)	9.0
					<u>Sr</u>	pecifications (Quantity and Typ	<u>e)</u>
		·	Ť		Sand:	Filtration Sand	
	Д		Sand		Granular Bentonite Seal:	Benseal Sodium Bentonite	
		Screen Length	_		Surface Completion:	Flush mount with concrete pad	
		Scre	<u> </u>	$\overline{}$			
		Length of Expend	g F				



PROJECT NUMBER PROBE NUMBER SG-76 678601.ET.01 8/12/2016 SHEET 1 OF 1 DATE:

Soil Gas Probe Installation Form

PROJECT: SE Rockford Groundwater Contamination Superfund Site LOCATION: Rockford, IL

DRILLING CONTRACTOR: Terra Probe Environmental

DRILLING METHOD AND EQUIPMENT USED: Geoprobe 6620DT 2.25 inch outer diameter rods

START: 8/12/2016 13:40	END: 8/12/2	2016 14:25	LOGGER:		
1					
	Grour	nd Level	Outer Diameter	of Boring (in.)	2.25
	Probe Vault		(1) Depth to Bottom of S	creen (ft. bgs)	15.0
	Seal Seal		(2)Depth to Top of	Sand (ft. bgs)	14.0
	entonite		(3)Depth to Top of Dry Granular Bentonite	Seal (ft. bgs)	9.0
	Chips anular Bo		(4)Depth of Pr	robe Vault (ft.)	0.8
	entonite ((1-2) Lengt	th of-Sand (ft.)	1.0
	Hydrated Bentonite Chips ————————————————————————————————————	'	(2-3) Length of Dry Granular Bent	onite Seal (ft.)	5.0
	- Hyc	Sand	(3-4) Length of Hydrated Bent	onite Seal (ft.)	8.2
		top of od)	Screen Diameter (in.	.) / Length (ft.)	0.5" /0.5'
		Depth to Bottom of Screen (length of rod)	Scre	een Mesh (in.)	0.006
		- Screen (I	Teflon Tubing Outer	Diameter (in.)	0.25
	Seal	ttom of 8	Flush Mount	Diameter (in.)	6.0
	Sentonite	pth to Bc	Length of Exper	ndable Tip (ft.)	0.2
	Dry Granular Bentonite Seal	De De	Soil Bori	ing Conducted	No
	Dry G		Sand B	Backfill (ft. bgs)	1.5
			Specifications (C	Quantity and Type)	
	V	*	Sand: Filtration Sand	.d	
<u> </u>		Sand	Granular Bentonite Seal: Benseal Sodio	um Bentonite	
	Screen Length	й I	Surface Completion: Flush mount v	with concrete pad	
	Scree	\downarrow \downarrow			
	Length So able Tip				



PROJECT NUMBER PROBE NUMBER SG-77 678601.ET.01 8/10/2016 SHEET 1 OF 1 DATE:

Soil Gas Probe Installation Form

LOCATION: Rockford, IL PROJECT: SE Rockford Groundwater Contamination Superfund Site

DRILLING METHOD AND E		obe 6610DT 2.25 inch outer diameter rods
START: 8/10/2016 9:25	END: 8/10/2016 12:20	LOGGER:
- 1	Craved Lavel	Outer Diameter of Boring (in.) 2.25
	Ground Level	Outer Diameter of Boring (in.) 2.25
	Probe Vault	(1) Depth to Bottom of Screen (ft. bgs) 16.4
		(2)Depth to Top of Sand (ft. bgs)15.3
	3entonite	(3)Depth to Top of Dry Granular Bentonite Seal (ft. bgs) 10.4
	tentonite ranular E	(4)Depth of Probe Vault (ft.) 0.8
	ranular B	(1-2) Length of-Sand (ft.) 1.1
	Hydrated Granular Bentonite Depth to Top of Dry Granular Bentonite Seak	(2-3) Length of Dry Granular Bentonite Seal (ft.) 4.9
		(3-4) Length of Hydrated Granular Bentonite Seal (ft.) 9.6
	Hy Hy Depth to top of Sand angth of rod)	Screen Diameter (in.) / Length (ft.) 0.5" /0.5' Screen Mesh (in.) 0.006
	leg (leg) uea.	Teflon Tubing Outer Diameter (in.) 0.25
	ar Bentonite Seal	Flush Mount Diameter (in.) 6.0
	Dry Granular Bentonite Seal Depth to Bottom	Length of Expendable Tip (ft.) 0.2
	ranular B	Soil Boring Conducted Yes
	Dıy Gi	Sand Backfill (ft. bgs) 7.7
		Specifications (Quantity and Type)
	 	Sand: Filtration Sand
Щ	Sand	Granular Bentonite Seal: Benseal Sodium Bentonite
	Screen Length	Surface Completion: Flush mount with concrete pad
	Length Scre	
	_ g g E ↓	



 PROJECT NUMBER
 PROBE NUMBER
 SG-78

 678601.ET.01
 SHEET 1 OF 1
 DATE: 8/11/2016

Soil Gas Probe Installation Form

PROJECT: SE Rockford Groundwater Contamination Superfund Site LOCATION: Rockford, IL

DRILLING METHOD AND E START : 8/11/2016 9:50		D.D. Hand Auger LOGGER :	
1			
 I	Ground Level	Outer Diameter of Boring (in.)	2.0
	Probe Vault	(1) Depth to Bottom of Screen (ft. bgs)	11.4
	\$\frac{\text{\tiny{\text{\tiny{\text{\tin}\text{\tetx{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tinit}\\ \text{\tin}}\\ \tint{\text{\text{\text{\text{\text{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texi}\text{\text{\texi}\tint{\tex{\text{\texi}\text{\text{\text{\tinch{\text{\texi}\text{\texit{\tin\tinte\tint{\texit{\text{\texi}\tint{\texi}\tint{\text{\texit}	(2)Depth to Top of Sand (ft. bgs)	10.3
	entonite	(3)Depth to Top of Dry Granular Bentonite Seal (ft. bgs)	5.3
	anular B	(4)Depth of Probe Vault (ft.)	0.8
	inular Be	(1-2) Length of-Sand (ft.)	1.1
	Hydrated Granular Bentonite Depth to Top of Dry Granular Bentonite Seal-	(2-3) Length of Dry Granular Bentonite Seal (ft.)	5.0
	- Hydra Depth I	(3-4) Length of Hydrated Granular Bentonite Seal (ft.)	4.5
	Hy Hy Popth to top of Sand angth of rod)	Screen Diameter (in.) / Length (ft.)	0.5" /0.5'
	Depth t	Screen Mesh (in.)	0.006
	Screen (Teflon Tubing Outer Diameter (in.)	0.25
	Seal	Flush Mount Diameter (in.)	6.0
	ar Bentonite Seal	Length of Expendable Tip (ft.)	0.2
	Dry Granular Bentonite Seal Depth to Bottom o	Soil Boring Conducted	Yes
	_Dry Gre	Sand Backfill (ft. bgs)	0.0
		Specifications (Quantity and Type)
	 	Sand: Filtration Sand	
Д	Sand	Granular Bentonite Seal: Benseal Sodium Bentonite	
	Screen Length	Surface Completion: Flush mount with concrete pad	
	Length of Expen dable Tip		



PROJECT NUMBER PROBE NUMBER SG-79 678601.ET.01 SHEET 1 OF 1 8/12/2016 DATE:

Soil Gas Probe Installation Form

PROJECT: SE Rockford Groundwater Contamination Superfund Site LOCATION: Rockford, IL

START: 8/12/2016 9:40 END: 8/12/2016 11:45 LOGGER: Ground Level Outer Diameter of Boring (in.) 2.25 (1) Depth to Bottom of Screen (ft. bgs) 13.4 (2)Depth to Top of Sand (ft. bgs) 6.3 (3)Depth to Top of Dry Granular Bentonite Seal (ft.) 0.8 (1-2) Length of Sand (ft.) 2.1 (2-3) Length of Dry Granular Bentonite Seal (ft.) 5.0 (3-4) Length of Hydrated Granular Bentonite Seal (ft.) 5.5	
(1) Depth to Bottom of Screen (ft. bgs) 13.4	
(1) Depth to Bottom of Screen (ft. bgs) 13.4	
(O) Positive Total Constitution	5
(2)Depth to Top of Sand (ft. bgs) 11.3 (3)Depth to Top of Dry Granular Bentonite Seal (ft. bgs) 6.3	1
(3)Depth to Top of Dry Granular Bentonite Seal (ft. bgs) 6.3	3
	3
(4)Depth of Probe Vault (ft.) 0.8	3
නි ල් ල් විට ල් ල් ල් ල් ල් ල් ල් ල් 	<u> </u>
to the particular of the particular serious properties of the particular serious prop)
ਹੁੰਦੀ ਸ਼ੁਰੂ (3-4) Length of Hydrated Granular Bentonite Seal (ft.) <u>5.5</u>	5
Screen Diameter (in.) / Length (ft.) 5.5 Screen Mesh (in.) 0.006	!
Screen Mesh (in.) 0.006	5
Teflon Tubing Outer Diameter (in.) 0.25	5
Flush Mount Diameter (in.) 6.0)
Screen Dlameter (in.) / Length (it.) 0.5° /0.5' Screen Mesh (in.) 0.006	2
Flush Mount Diameter (in.) 6.0 E	3
ਤੰ Sand Backfill (ft. bgs) 8.4	1
Specifications (Quantity and Type)	
Sand: Filtration Sand	
Granular Bentonite Seal: Benseal Sodium Bentonite	
Surface Completion: Flush mount with concrete pad	
Screen L	
Expen dable Tip	



 PROJECT NUMBER
 PROBE NUMBER
 SG-80

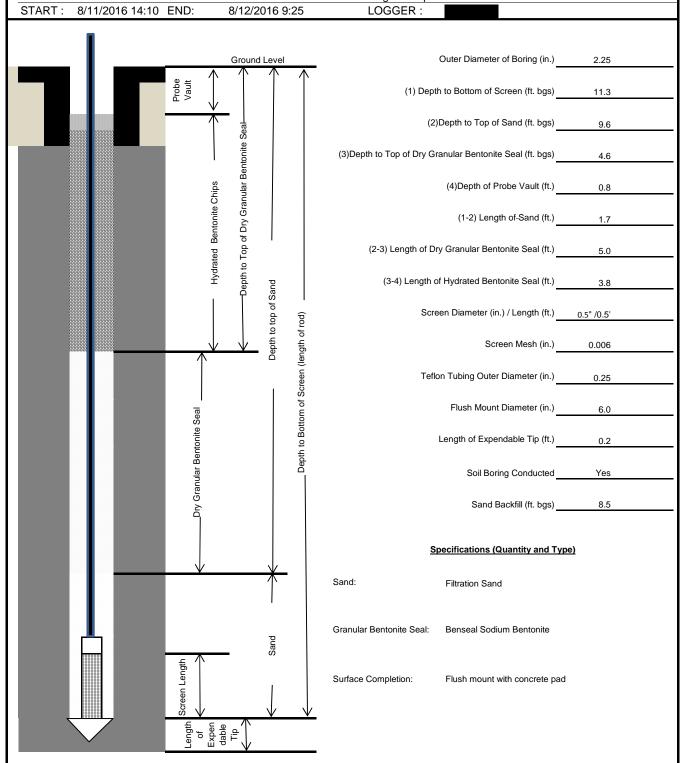
 678601.ET.01
 SHEET 1 OF 1
 DATE: 8/12/2016

Soil Gas Probe Installation Form

PROJECT: SE Rockford Groundwater Contamination Superfund Site LOCATION: Rockford, IL

DRILLING CONTRACTOR: Terra Probe Environmental

DRILLING METHOD AND EQUIPMENT USED: 2.5" O.D. Hand Auger/Geoprobe 6610DT 2.25 inch outer diameter rods





 PROJECT NUMBER
 PROBE NUMBER
 SG-81

 678601.ET.01
 SHEET 1 OF 1
 DATE: 8/12/2016

Soil Gas Probe Installation Form

PROJECT: SE Rockford Groundwater Contamination Superfund Site LOCATION: Rockford, IL

DRILLING CONTRACTOR: DRILLING METHOD AND EC START: 8/12/2016 8:15	QUIPMENT USED: 3.0" O	.D. Hand Auger LOGGER:	
START . 6/12/2016 6.15	END. 6/12/2016 9.30	LOGGER .	
	Ground Level	Outer Diameter of Boring (in.)	3.0
	Probe	(1) Depth to Bottom of Screen (ft. bgs)	8.0
		(2)Depth to Top of Sand (ft. bgs)	7.0
	Hydrated Granular Bentonite Depth to Top of Dry Granular Bentonite Sealand	(3)Depth to Top of Dry Granular Bentonite Seal (ft. bgs)	5.0
	anular E	(4)Depth of Probe Vault (ft.)	0.8
	Hydrated Granular Bentonite epth to Top of Dry Granular B	(1-2) Length of-Sand (ft.)	1.0
	rated Grato Top c	(2-3) Length of Dry Granular Bentonite Seal (ft.)	2.0
	- Hydi - Depth f Sand	(3-4) Length of Hydrated Granular Bentonite Seal (ft.)	4.2
	Hyy Hyd Cand Depth to top of Sand angth of rod)	Screen Diameter (in.) / Length (ft.)	0.5" /0.5'
	(length depth	Screen Mesh (in.)	0.006
	Screen	Teflon Tubing Outer Diameter (in.)	0.25
	te Seal	Flush Mount Diameter (in.)	
	Dry Granular Bentonite Seal	Length of Expendable Tip (ft.)	0.2
	3ranular D	Soil Boring Conducted	
	Dry (Sand Backfill (ft. bgs)	2.0
		Specifications (Quantity and Type)	
		Sand: Filtration Sand	
L L	Sand	Granular Bentonite Seal: Benseal Sodium Bentonite	
	Screen Length	Surface Completion: Flush mount with concrete pad	
	Length Screen of Carpen dable Tip		
	P Z B ⊢ ↓		



 PROJECT NUMBER
 PROBE NUMBER
 SG-82

 678601.ET.01
 SHEET 1 OF 1
 DATE: 8/10/2016

Soil Gas Probe Installation Form

PROJECT : SE Rockford Groundwater Contamination Superfund Site LOCATION : Rockford, IL

RILLING METHOD AND E TART: 8/10/2016 13:55		O.D. Hand Auger LOGGER:	
	Ground Level	Outer Diameter of Boring (in.)	3.0
	Probe Vault	(1) Depth to Bottom of Screen (ft. bgs)	13.4
	Sea	(2)Depth to Top of Sand (ft. bgs)	12.4
	Hydrated Granular Bentonite Depth to Top of Dry Granular Bentonite Seal- iand	(3)Depth to Top of Dry Granular Bentonite Seal (ft. bgs)	7.4
	Hydrated Granular Bentonite epth to Top of Dry Granular B nd	(4)Depth of Probe Vault (ft.)	0.8
	ınular Be	(1-2) Length of-Sand (ft.)	1.0
	ated Gra to Top o	(2-3) Length of Dry Granular Bentonite Seal (ft.)	5.0
	- Hydr -Depth	(3-4) Length of Hydrated Granular Bentonite Seal (ft.)	6.6
	Hy Hy Depth to top of Sand angth of rod)	Screen Diameter (in.) / Length (ft.)	0.5" /0.5'
	Depth (length c	Screen Mesh (in.)	0.006
	ar Bentonite Seal	Teflon Tubing Outer Diameter (in.)	
	te Seal	Flush Mount Diameter (in.)	
	Dry Granular Bentonite Seal	Length of Expendable Tip (ft.)	0.2
	3ranular D	Soil Boring Conducted	
	Dry	Sand Backfill (ft. bgs)	2.0
		Specifications (Quantity and Type	<u>e)</u>
	*	Sand: Filtration Sand	
LΙ	Sand	Granular Bentonite Seal: Benseal Sodium Bentonite	
	Screen Length	Surface Completion: Flush mount with concrete pad	
		<u>/</u>	
	Length of Expendable Tip	_	

Attachment 4 Soil Gas Sampling Forms

August 2016



#1581.5	Project Info Project Name: SE	Rechard		Project # : 6760) (£7 v0)
	Sampler Name:			Date: 8006
THE SECOND	1 SIGE 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	The state of the state of	to deal of	"M. I" "E' A TOTAL TOTAL
	Describe vadose zo	ver Bare er (feet below ground surface	Soil Gras Vaknos Is.H Clay	
			7 100-200	
Sample location show in diagram		n, Purging, Leak Chec	Field Analysis	GEW2000 - O2 (%)
Probe and Sam identification (fi		-74-05H	(optional)	GEM2000 - CO2 (%)
Probe Installation	121	1211		GEM2000 - CH4 (%)
	Depth of hole drilled (feet below ground surface)	13.01		PID - Total VDCs (ppmv)
	Bottom of probe screen (feet below ground surface)		Canister Sampling	Canister ID
	Length of probe screen (inches)	64		Flow controller ID
	Width of probe screen (inches)	0.5		Pressure gauge ID (optional)
	Dead volume - including screen, sand pack, and tubing (mL)	0.64		Sampling rate or period (mL/min or hours)
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	2055		Sample start date and time
Probe Purge	Purge rate (mL/min)	0.1		Initial canister pressure ("Hg)
	Purge start time	1415		Sampling vacuum (THg)
	Purge vacuum ("Hg)	0.8-0		Sample completion date and time
	Purge completion time	1418		Final canister pressure (" Hg)
felium Leak Check*	Leak check (% or ppmv helium)	NA		
concentration is le	obe passes the helium leak check if th ess than 1,000 ppm (0.1%) Do NOT e helium leak test	collect a soil gas sample if		
Weather cond	litions during sampling:	Sunny 80		
Observations C	and Comments: Purge	land vace	Did N	entuzto -8. Stock





Compression Co	pulled purity present	Project info						
Sampler Name: Site Information Describe pround cover Digital Digital Digital Digital Describe various ground cover Digital Digital Describe various ground cover Digital Digital Describe various ground cover Digital Digital Describe various ground surface) Describe various ground surface) Describe various ground surface) Describe installation Purpling Leak Checking & Samplings Log Purplings Leak Checking & Samplings Log Purplings Digital Digita		Project Name: 95	ERock ford			Project #	and the second of the second s	una:
Identification: Address: Site Informatio Describe ground cover Despit to groundwater (feet below ground surface) Describe various zone on type(s) Soft Gas Private Installation): Purging: Leek Chee/strig: & Sampling Log: was a probe dagram completed? Soft Gas Private Installation): Purging: Leek Chee/strig: & Sampling Log: was a probe dagram completed? Soft Gas Private Installation (SER_SG_SG_SG_SG_SG_SG_SG_SG_SG_SG_SG_SG_SG_		Sampler Name:	STORES - MANAGE - Property			and the same of th		٠ إ
Identification: Address: Site Informatio Describe ground cover Despit to groundwater (feet below ground surface) Describe various zone on type(s) Soft Gas Private Installation): Purging: Leek Chee/strig: & Sampling Log: was a probe dagram completed? Soft Gas Private Installation): Purging: Leek Chee/strig: & Sampling Log: was a probe dagram completed? Soft Gas Private Installation (SER_SG_SG_SG_SG_SG_SG_SG_SG_SG_SG_SG_SG_SG_		Ver out transfer average province	description description de	Militalia	en e tiene in de la come in de vinaria	duneris and institutions of	AGTACONO POSTER POSTER PRINTED AND THE PRINTED	-
Address: Site Informatio Describe pround cover Despits to groundwater (feet below ground surface) Describe various cover (feet below ground surface) Describe various cover provincy Soff Gas Private Installation of Purging. Leak Checkting, & Sampling Log was a probe diagram own in diagram Describe and cover in the control of the contr		CONTRACTOR OF THE PROPERTY OF						<u> </u>
Site Information Describe gound-cover Legislation gound-water (feet below gound-surface) Describe variose zone soit type(s) Suff Case Probe Installation(Furpling, Leak Cheeking, & Sampling, Log Was a probe diagram completed? Soil Gase Probe Installation(Furpling, Leak Cheeking, & Sampling, Log Soil Gase Probe Installation(Furpling, Leak Cheeking, & Sampling, Log Soil Gase Probe Installation(Furpling, Leak Cheeking, & Sampling, Log Soil Gase Probe Installation(Furpling, Leak Cheeking, & Sampling, Log Soil Gase Probe Installation(Furpling, Leak Cheeking, & Sampling, Log Soil Gase Probe Installation(Furpling, Leak Cheeking, & Sampling, Log Soil Gase Probe Installation(Furpling, Leak Cheeking, & Sampling, Log Field Analysis GENZOOC-02 (%) 111,5 GENZOOC-02			- 75	-		The state of the s		
Describe ground cover Depth to groundwater (feet below ground surface) Describe widose zone sot kype(s) Was a probe dagram completed? Was a probe dagram				<u>-</u>	The second secon	The state of the s		
Depth to groundwater (feet below ground surface) Describe vadoes zone tool type(s) Was a probe negram completed? Was a probe negram completed? Was a probe negram completed? Solf Gas Probe Installation (Peurglag, Leak Checkling, & Sampling Log 9) Field Analysis (popular) Debuggin of hole and time \$10,000 BR ASS Depth of hole and sime \$10,000 BR ASS Depth of hole and entire \$10,000 BR ASS Depth of hole and sime \$10,000 BR ASS Depth of hole and time \$10,000 BR ASS Sample and probable and time \$10,000 BR ASS Sample and time \$10,000 BR ASS Sample and time \$10,000 BR ASS Depth of hole an			over Vegit	1	m, Dirt	Tra.)		
Describe vadose zone soil type(s) Was a soil boring log completed? Was a soil boring log completed? Salf Sas. Probe installation! Purging! Leek Checking. 4: Sampling Log Field Analysis (optional) Field Analysis (optional) Field Analysis (optional) GEM2000-02 (%) Light of hole direct below ground surface) Bottom of probe screen (reches) Length of probe screen (reches) Length of probe screen (reches) Width of probe screen (reches) Width of probe screen (reches) Dead volume - including screen, and pack, and tubing final. Dead volume - including screen, and pack, and tubing final. Purge rate (mLmm) Purge rate (mLmm) Purge valeum ("Hg) Purge valeum ("Hg) Purge valeum ("Hg) Purge completion time Purge valeum ("Hg) Leak check (sor open helum) Purge completion time Purge valeum ("Hg) Do NOT collect on plants and pack Each check ("No or ppm helum) Assumpting completion time Purge start time Purge completion time Purge completion time Purge completion time Purge completion time Purge valeum ("Hg) Do NOT collect on plants and pools Sampling valeum ("Hg) Sampling valeum (Depth to groundwa			7.51			
Was a sof boring log completed? Was a probe diagram completed? Soft Gas Probe Installation! Purpling Leak Checking, & Sampling Log mple location (describe and win diagram) be and Sample milication (flest ID) Depin of lode direct (flest below ground surface) Depin of lode (flest below g		Describe vadose z	one soil type(s)				The state of the s	
### Soff Gae Probe Installation: Purging Leek Checking & Sampling Log Purging location (describe and own in dispans)		Was a soil boring to			Was a pro	bbe diagram completed?	yes &	
proble and Sample indication (field to) Deal and time \$ 12								
Purge rate (millim) Purge start time Purge vacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge space time Purge completion time Purge space time Purge completion time	A CAPP	Soll Gas Probe Installation	on Purging, Leek Che	ckir	d. & Sampling	Log P SC		90
town in disignamy be and Sample indiffication (field ID) Date and III	mple location	n (describe and	Programme and the control of the con	Antenna	77771			
Date and time \$\frac{12}{12} \		CONTRACTOR AND ADDRESS OF THE PARTY OF THE P				GEM2000 - O2 (%)	14,5	1425 c
Date and time \$\frac{1}{2} \] \$\text{Deph of hote diffied (feet below ground surface)}\$ Deph of hote diffied (feet below ground surface) Bottom of probe screen (feet below ground surface) Length of probe screen (inches) Length of probe screen (inches) Uxidit of probe screen (inches) Dead volume - including screen, sand pack, and futiong (incl.) Dead volume - including screen, sand pack, and futiong (incl.) Dead volume - including screen, sand pack, and futiong (incl.) Dead volume - including screen, sand pack, and futiong (incl.) Dead volume - including screen, sand pack, and futiong (incl.) Dead volume - including screen, sand pack, and futiong (incl.) Dead volume - including screen, sand pack, and futiong (incl.) Sampling rate or period (incl.) MA Sampling rate or period (incl.) Milliam these has been passed in the feet of pack of the f		ield ID) SER~SG	75-0816			GEM2000 - C23 (%)	4	'
Depth of hole drifted (feet below ground surface) Bottom of probe screen (feet below ground surface) Bottom of probe screen (feet below ground surface) Length of probe screen (feet below ground surface) Length of probe screen (feet below ground surface) Length of probe screen (feet below ground surface) Width of probe screen (inches) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Sampling rate or period (inclimin or hours) (inclimi		1 .		1		GEM2007-CHI4 (%)		-
ground surface) Bottom of probe screen (feet below ground surface) Length of probe screen (mches) Length of probe screen (mches) Width of probe screen (mches) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack and tubing (mL) Dead volume - including screen, sand pack and tubing (mL) Dead volume - including screen, sand pack and tubing (mL) Dead volume - including screen, sand pack and tubing (mL) Dead volume - including screen, sand pack and tubing (mL) Sampling rate or period (mL/min or hours) Sample stant date and time (Hall by Sample stant date and time (Hall by Sample completion time Purge start time Purge vacuum ("Hg) Sampling vacuum ("Hg) Samplin		1 110						-
ground surface) Length of probe screen (inches) Width of probe screen (inches) Dead volume - including screen, sand pack, and tubing (incl.) Dead volume - including screen, sand pack, and tubing (incl.) Dead volume - including screen, sand pack, and tubing (incl.) Dead volume - including screen, sand pack, and tubing (incl.) Dead volume - including screen, sand pack, and tubing (incl.) Dead volume - including screen, sand pack, and tubing (incl.) Dead volume - including screen, sand pack, and tubing (incl.) Sampling rate or period (incl./min or hours) Sampling start date and time [Hg] Sampling vacuum (india canslet pressure (india canslet pr			6.01				0	
Length of probe screen (inches) With of probe screen (inches) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Dead volume - including screen, sand pack, and tubing (mL) Samplar rate or period (inc/min or hours) Sample start date and time Dead volume - including screen, sand pack, and tubing manifold) Purge rate (inclumin) Purge start time Purge start time Purge vacuum ("Hg) Purge completion time Purge start time Purge start time Purge vacuum ("Hg) Sampling vacuum CHg) Sampling vacuum			w 6.0 '		1	Canister ID	15000693	1
Vixith of probe screen (inches) Dead volume - including screen, sand pack, and fubring (mL) Dead volume - including screen, sand pack, and fubring (mL) Mitfold Leak Pass/No Pass Purge rate (mL/min) Purge start time Purge vacuum ("Hg) Purge vacuum ("Hg) Purge ompletion time Purge ompletion time Purge soli gas probe passes the helium leak check if the detected helium centration is less than 1,000 ppm (0 1%). Do NOT collect a soil gas sample if probe fails the helium leak test Pather conditions during sampling: Vixith of probe screen (inches) O, 3, 41 Sampling rate or period (imL/min or hours) Sample start date and time ("Hg) Sampling vacuum ("Hg) Sampl		Length of probe screen (inches)	64			Flow controller ID		
Dead volume - including screen, sand pack, and fubring (mL) mitfold Leak		Width of probe screen (inches)	25'				, IA	٠,
Leak check (sampling manifold) - Pass/No Pass Purge rate (mL/min) 2005 m m m m m m m m m m m m m m m m m m						Sampling rate or period	600 111	
Purge rate (mL/min) Purge start time Purge vacuum ("Hg) Purge completion time Purge completion time Purge completion time Perge vacuum ("Hg) Purge completion time Purge completion time Purge completion time Purge completion time Pinal canster pressure ("Hg) Sampling vacuum ("Hg)	nnifold Leak leck	Leak check (sampling manifold) -		1		Sample start	2/12/11 BO	4
Purge vacuum ("Hg) Purge completion time Purge completion time Purge soli gas probe passes the helium leak check if the detected helium recentration is less than 1,000 ppm (0.1%). Do NOT collect a soil gas sample if probe fails the helium leak lest eather conditions during sampling: Sampling vacuum ("Hg) Sampling	be Purge	Purge rate (mL/min)				Initial canister pressure	-29 08	1
Purge completion time Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Final canister pressure (*Hg) Purge completion Call to 989 Final canister pressure (*Hg) Purge completion Final canister pressure (*Hg) Final ca		Purge start time	. 10			Sampling vacuum	OF STREET	-
Purge completion time O902 Final canister pressure (Hg) Final c		Purge vacuum ("Hg)				a_4_'	8/18/1 0909	1.
the soil gas probe passes the helium leak check if the detected helium incentration is less than 1,000 ppm (0.1%). Do NOT collect a soil gas sample if probe fails the helium leak test is eather conditions during sampling: DS		Purge completion time	0902				-5.90	
ne soil gas probe passes the helium leak check if the detected helium icentration is less than 1,000 ppm (0.1%). Do NOT collect a soil gas sample if probe fails the helium leak test seather conditions during sampling: Do S S V		Leak check (% or ppmv helium)	022m V 2	25			,	_
probe falls the helium leak test eather conditions during sampling: Descriptions and Comments:	he soil gas pro	be passes the helium leak check if to	he detected helium	٦ ٠2	ני			
servations and Comments:	probe fails the	ess man 1,000 ppm (0.1%). Do NO 2 helium leak test	I collect a soil gas sample II					
pservations and Comments:	eather cond	litions during sampling	705 (1100	n -	,			
		ouniphilig.	/U JOIN	6	1944 Held Held Held Mehidoldensenderster som nor anna	TSA-A-11A		
			entre de material proposación de la companiente del la companiente de la companiente del la companiente de la companiente de la companiente de la companiente del la companiente de la companien			AN ALL AND ARROWS A COMPANY OF THE PARK OF		
1 7 vige volume 0,34 L Helm Start 39,69 should	servations	and Comments:	and the second section of the section of the second section of the secti		minuta ununtationale tale also mississipose propries			
V. 11/15/11 1 purge volume 0,34 L Helm Start 39,69 should		AND MANAGED Schools or several surface from the SML of SML of Additionally Page 1944 and 194 September 1940 and		*****	**************************************	SETT A PER PERSONAL AND	indicated accounts to all-AM-40 or was not near the same and the subject of subject to	
1 7019C Volume 0,34 [Helm 4= 27.89 Sherand	V 11/15/11	Temperatus provideras para en almateratularia simplementa del Antonio Alemano, per que se en esta que para que en el composição de la composiç			. h.	J. H. J	2919 ch-	.1
1315-111. 1.7 m. Helm de - 27.89. Sherad	.verniori) Sind	L volume 0,3	Ψ,	(110			
		134	1.7)	H,	dm H	27,89 Shine	w



Sheet of

	Project Info		And the second		A CENT	计划的数据的时间
	Project Name: SE Y			Project #		
	SIE 1	The state of	k også også ekster	though the interrupts of	MAIN WIN	
	Identification: Address: Site Information: Describe ground conduction Depth to groundwate Describe vadose zo Was a soil boring log	er (feet below ground surface; ne soil type(s)	Unknon Sand clay		yes	
	Soli Gas Probe Installation	n, Purging, Leak Chec		Log		T. M.
Sample location show in diagram			Field Analysis (optional)	GEM2000-02 (%)	6/5	Hos= da
Probe and Sam Identification (fi		76-0816 -0	KLN	GB#2000 - CO2 (%)	1811 1181	1,23 90
Probe Installation Manifold Leak Check Probe Purge	Date and time 8 2 6 Depth of hole drilled (feet below ground surface) Bottom of probe screen (feet below ground surface) Length of probe screen (inches) Width of probe screen (inches) Dead volume - including screen, sand pack, and tubing (mL) Leak check (sampling manifold) - Pass/No Pass Purge rate (mL/min) Purge start time Purge vacuum ("Hg)	15,51	Carister Sampling	GE(2020) CH4 (%) PID - Total VOCs (ppmv) Canister ID 1 5 C Flow controller ID Pressure gauge ID (optional) Sampling rate or period (mL/min or hours) Sample start date and time Initial canister pressure ("Hg) Sample completion date and time Final canister pressure ("Hg)	14/7 0/0 00228/15c. 0A01196 NA 8min/sinda	2013 8 (single PC Can 10 min 2 can 8/16 123
Hellum Leak	Leak check (% or ppmv helium)	11 1	MIL D	1 1 21	10.00	<u> </u>
concentration is to the probe fails the Weather cond	Jube passes the helium leak check if the ess than 1,000 ppm (0 1%). Do NOT e helium leak test. Stitions during sampling:		nv pars,			
REV. 11/15/11		32.97 ins		puzzvalun puzzvalun	0.52L	inter

ch2m:

	Project Info					
	Project Name:	Rockford		Project #	C 11.	(G.T.A)
	Structure		Section Review Cons			
· <u></u>	Identification: SG	-77				
	Address:		78.			
Gomica	Slab Information:	2002	Des	アナーハッナンララ	1,91	
Boning Lo		inder the slab (gravel, sand, e) the soil?	(c) Slaw Sand			
	Subslab Soil Gas Probe i	installation, Probe Puri	ging, Leak Checkin	a. & Sampling Log		And the second
Sample location (show in diagram)	(describe and	10,000	Field Analysis	02 (%)	17.8	15.8
Probe and Sampl dentification (fie		7-0816	MultiRAE PID	CO (ppm)	13 1	0
Probe Installation	Date and time	8/10/14		H2S (ppm)	0	O
	Thickness of state (inches)	16.6		LEL (%)	0	14
	Depth of hole drilled (Inches below at Post			Total VOCs (ppm)	0.4	10.4
	PID (ppmv) Longth of Pol	Widts 6"/0:	Canister Sampling	Canister ID Boda	150	2, 0880
	Depth of installed probe (Inches below slab surface)	0.49]	Flow controller ib	740 7	065-040
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	2022 Jaks]	Pressure gauge ID (optional)	NA	
Probe Purge	Purge rate (mL/min)	0,2110		Sampling rate or period (mL/min or hours)	14/9	Bmijutes
	Purge start time	1437		Sample start date and time	D 15	01
	Purge vacuum (* Hg)	0		Initial canister pressure (" Hg)	28.7	1-28.77
	Purge completion time	1445		Sampling vacuum (" Hg)	0	
Vater Dam Leak Check*	Leak check (pass or fail?)	2045]	Sample completion date and time	1510	5
oubbles observed	gas probe passes the water damile and the water level doesn't drop wit collect a subslab soil gas sample if	hin the water dam during		Final canister pressure (* Hg)	1,66	
Weather condi	tions during sampling:	Hot Humid Su	my 85			
Theoretions of	and Commonte:					
JUSUI VALIONS &	and Comments: Pursy	Volume 0.49	L time	lange Vol-	اسر ة	2.5 minul
Ho	the hord stand	t 36,6%	19			
	Er	1 24.19				
	,	7 34, 19, m	2 /n 2092	gas.		
	(م الدين	0	U		

ch2m:

	Project Name: SE Sampler Name:	Rockford		Project # :	5/16/16
	Structure			SHEET AND DESCRIPTION	NAME OF THE PARTY OF THE PARTY.
	Address: Slab Information: Condition of slab Describe material und		eg & conz	Maria	V:Unknown
Sample location	Subslab Soil Gas Probe In:	stallation, Probe Purgin	Field Analysis	g, & Sampling Log	108 (5
show in diagram Probe and Samp					65
Identification (fie	old ID) S SS SE	R-855-78-5816	MultiRAE PID	CO (ppm)	0
Installation		50		H2S (ppm)	6
	Thickness of slab (Inches)	of Pobellib		LEL (%)	10
	Depth of hole drilled (Inches below slab surface)	Lengthi 6 inches		Total VOCs (ppm)	0,1
	Total VOCs measure in hole with PID (ppmv)	6,38	Canister Sampling	Canister ID	1500 0769
	Depth of installed probe (inches below slab surface)	NA		Flow controller ID	04:0A 02094
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	2025		Pressure gauge ID (optional)	NA
Probe Purge	Purge raté (mt/min)	DALPM		Sampling rate or period (mL/min or hours)	11/7 minores
	Purge start time	1543 8/6/4		Sample start date and time	1550 8/16/14
	Purge vacuum (" Hg)	0		Initial canister pressure (" Hg)	-28,74
No. 1, 1970 PARKS - 1	Purge completion time	1548	ř	Sampling vacuum (* Hg)	0
Water Dam Leak Check*	Leak check (pass or fall?)	595)		Sample completion date and time	1857 9144
bubbles observed	gas probe passes the water dam leak and the water level doesn't drop with collect a subslab soil gas sample if the	n the water dam during		Final canister pressure (" Hg)	-2.73
	* .	SVANY 850	thend		
weather cond	itions during sampling:				
Ohservations :	and Comments:				
Obdervations i	and Comments.				
		TO THE STATE OF TH			
	Purge Vilon	L 0.38 L	401.00	at Start = 40	0,19
	1 Porge Vilu	L Time 1.9.	MIN	d = 0	9.2%
	المراه بر) A A	14/1/	2705	70

ch2m:

	Project Info	mgarestant, iks	rability rate		
	Project Name: SE	Rockford		Project # :	8/16/16/101
THE ATTER	Structure		医学院等 2000年		
	Address: Slab Information:	R-56-79-0 rowlcom: 6ras note: the state (gravel, send, etc.) the soil? Burny Locy	s, Depth to	SM: 51, 2=11	Types Still Sand
	Substab Soil Gas Probe in	nstallation, Probe Purgi	ng, Leak Checkin	g, & Sampling Log	
Sample location show in diagram			Field Analysis	0 (%)	
Probe and Samp Identification (fie	le SER-SE	-79-0816	MultiRAE PID	CO (ppm)	
Probe Installation	Date and time 8 12/16 11	45		H2S (ppm)	
	Thickness of slab (inches) Pez	11 01 00000		LEL (%)	
ĺ	Depth of hole drilled (Inches below slab surface)	Mbcreen 6"		Total VOCs (ppm)	
	Total VOCs measure in hole with PID (ppmv)	Width of Screens	Canister Sampling	Canister ID	· *
	Depth of installed probe (inches below slab surface)	10.69	Ct	Flow controller ID	0,0
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	Pass	F)	Pressure gauge ID (optional)	13
Probe Purge	Purge rate (mL/mln)	0:2Llm		Sampling rate or period (mL/min or hours)	1
	Purge start time	1629		Sample start date and time	
	Purge vacuum (" Hg)	8-100/1		Initial canister pressure (* Hg)	-28,79
	Purge completion time	1631	4	Sampling vacuum (" Hg)	
Water Dam Leak Check*	Leak check (pass or fall?)	NA		Sample completion date and time	
bubbles observed	gas probe passes the water dam lea and the water level doesn't drop with collect a subslab soil gas sample if t	hin the water dam during		Final canister pressure (" Hg)	
Weather cond	itions during sampling:	Suny 80			
	0	-	1 112		21/1
fort &	of sond . W	o pose dopo 1	16 CO	wind Smdc.	Mose has 2
	Hd. Ins 10. Stor 8 54:116-10 vaca	Perg = 32.3.	2. 21 +		
1621- NO	<nn3-10-2425< td=""><td>she allow bus</td><td>k to using</td><td>~</td><td></td></nn3-10-2425<>	she allow bus	k to using	~	
1645-	Still@-10 Vacu	.m. Notabl	2 to sons l		



	Project Info				
	Project Name: Sampler Name:	Rockford		Project # (Date:	10,73,107813
	Site ()			J ababy	a ja saat ti o
	Identification: Address: Site Information: Describe ground cor Depth to groundwate Describe vadose zo Was a soil boring log	ver G(ass er (feet below ground surface) ine soil type(s)Soval	Jay	obe diagram completed?	
Sample location	Soli Gas Probe Installatio	n, Purging, Leak Check	ring, & Sampling		
show in diagrar Probe and Sam Identification (fi	m)	Q-180-08-2	(optional)	GEM2000 - 02 (%)	499 CO
Probe Installation	Date and time 8 1216 00	50		GEM2000 - CH4 (%)	16.9 pid
	ground surface) Bottom of probe screen (feet below	11.5'	Canister	(ppm) Canister ID	H22 € 0
	ground surface) Length of probe screen (inches)	6 30 L'	Sampling	Flowcontroller ID	The second section of the section of the second section of the second section of the second section of the second section of the secti
	Width of probe screen (inches)	80 D.51		Pressure gauge ID (optional)	
Manifold Leak	Dead volume - including screen, sand pack, and tubing (mL) Leak check (sampling manifold) -	0.58		Sampling rate or period (mL/min or hours) Sample start	
Check	Pass/No Pass Purge rate (mL/min)	Pass O,2 L/min		date and time Initial canister pressure (" Hg)	TOY I
Probe Purge	Purge start time	1000		Sampling vacuum ("Hg)	N. C.
	Purge vacuum (" Hg)	-8		Sample completion date and time	
	Purge completion time	1987		Final canister pressure (" Hg)	
Helium Leak Check* * The soil gas pro	Leak check (% or ppmv helium)	700,006 27~	u fail		
	less Ihan 1,000 ppm (0.1%). Do NOT e helium leak lest	^			
Weather cond	ditions during sampling:	Synny 803		TI ANTIGO No. Alba Alba Alba Alba Alba Alba Alba Alba	
50	and Comments: Sert	543~ Wg	Vacyum	wat up to -	-8 Stat boy brief
10-8	Sample purge a	as had 700x	90 pgc/ 00	sen and pros	16.9, (b-400 0
REV. 11/15/1	1 13. HOW	ian (2) 1018			ا (هو په دې ا



Vapor Intrusion Best Practices Exterior Soil Gas Probe Installation and Sampling Log - Canister Method

	Project Info			AUS (
	Project Name: 51	Ractor	4	Project #		
	Sampler Name:			Date		'
	"Site!"		rkyr	My to being	TO TO THE TO	20/1
		R-56-80-10	100		A TANK	
	Address:				Section 1. The second section 1. The section 1. The second section	
	Site Information:	Dares Anto	C^	Annual Land - House of the Annual Control of	The second secon	
	Describe ground	cover water (leet below ground surface	Be Co	55		
			(Best)	14,6		
	Was a soil boning		Mas a or	obe diagram completed?	1005	
		u ju	**************************************	obe diagram completed?	Lyes .	
	Soli Gas Probe installe	don, Purging, Leek Chec	king & Semoling	l og	White the last the	밁
	n (describe and	etma. Internal i	Field Analysis	1		LEL
ow in diagram be and Sam	nle		(optional)	GEM2000 - O2 (%)	18.1	
ntification (fi	leid ID) 56-80	_		GEM2000 - CO2 (%)	0.993	
be tallation	Date and time 6 12/16	0750		GEM2000 - CH4 (%)	0.170	
	Depth of hole drilled (feet below ground surface)	4.5	Canister Sampling	PID - Total VOCs (ppmv)	NA	1
	Bottom of probe screen (feet be ground surface)	11.4.2		Canister ID	15500208	1
	Length of probe screen (inches	64		Flow controller ID	OAØ 1631	
	Width of probe screen (inches)	0.5'		Pressure gauge ID (optional)	NA	
	Dead volume - including screen sand pack, and tubing (mL)	0.58	ļ	Sampling rate or period (mL/min or hours)	5ml = 1 hr	23 mV
nifold Leak eck	Leak check (sampling manifold) Pass/No Pass	Pass		Sample start date and time	8/18/16 1555	
be Purge	Purge rate (mL/min)	50nl min		Initial canister pressure (" Hg)	-28,55	
	Purge start time	1356		Sampling vacuum ("Hg)	-8	
	Purge vacuum (" Hg)	-8		Sample completion date and time	8/18/16 17/8	
	Purge completion time	1547		Final canister pressure ("Hg)	-5,35	
ium Leak ck*	Leak check (% or ppmv helium)	30.370				ı
centration is le	be passes the helium leak check it ess than 1,000 ppm (0.1%). Do No e helium leak test	the detected helium OT collect a soil gas sample if				
ather condi	itions during sampling:	Suny 940F	миника балы майы «бордон» та макин атамындаруу фунуул арады	TTOPOM Mandangsapings PRINT No. Matthe delayances. or Am. Majorana property		
	and Comments: See	back zage	for purg	0) Sample	Log. Valves	ozer

REV:11/15/11

1358 Vac @-8 Stop punp close valve to pump Vac @ - Z 1408 turn on He Start Pump open value to pump 1410 vac @-8 Stop pump Close valve turn of 4e (21.090) 1420 Vac@-2 torn on the start pump Open value to pump 1422 vac @ -8 Stop pump close valve turn of He (32,7%) 1435 vac @ -2 turn on He Stand pump open in lie 1436 Vac @-8 turn off +11 (30.2) Stop pump Close value 1453 UNC Q-Z turn or the Start pumps open value 1454 VAEQ-8 He (26.8)

flow about asmil/min 1509 vac@-2 turn on the open value stat pump 1511 Vac @-8 (0.52) He (34.893) 1527 VACQ-2 turn on HI Stort pump 1578 WLB -8 (0,55 L) +le (38.09.) le @ 2500 ppm in purge air 1546 Unce -2 1547 Vac @ -8 He (30.390) 1555 Open value He ON

1629 close value (-16 He OF (24,190) 1645 open valoc (-13) 1556 close valve He ou. He of (31.4%) 1446 close who (-10 1611 open value (-22) He off (21,0%) 1701 Openualure (-10 He on He ON 1612 close value (-18) MOZ close Value (-7. He of (29.390) He of (31.5%) 1628 He ON 1717 Openualue (-6) opin va luc (-18) 1718 close valve (5 He off (22.22



ALC: NO. 184	Project info			La companya da	ar hand	
	Project Name: SE	Rockbard		Project #	10-T3.102872:	1
	Sampler Name:		ens ens ens som ensemtelskar stat baddelseska badterskippingen syntreppyringe gen syntreppyringe frei syntreppyringe	Date	: 8/18/16	
	Site 14 15 15	e zu "re	N. A. Maria	To all Mexico		i
	Identification: $SG-8$	1				1
	Address:			N Helicitation of the second s		
	Site Information: Describe ground or	over GRASS				
	_	iter (feet below ground surface	951		19-19-19-19-19 Milliodold Michigan em electron electricistes a commence em monte amuntanta, applicajuajus	
	Describe vadose z	Cl. I	an	- 47 - 141		
	Was a soil boring in	og completed?	✓ Was a pro	be diagram completed?	yes	
N. 10 100 - 100					1) ()	J
STATES.	Soll Gas Probe Installation	on, Purging, Leek Chec	king, & Sampling I	Log.	125% 01 0 6	10/0 35
Sample location show in diagram	n (describe and m)		Field Analysis (optional)	GEM2000 - O2 (%)	16,9/16,9/16,9/1	7,0117,0
Probe and Sam Identification (fi	ple SEN-SC	1130-18-		GEM2000 (%)	0/0/0/0/0	
Probe	1 11.	1	1 1	GEM2000CH4 (%)	7 7 9 9 0	35-
Installation	Depth of hole drilled (feet below	0930	Called	PID - Total VOCs	111111111	70
	ground surface)	10.3,		(ppmv)	00101010	252
	Bottom of probe screen (feet bek ground surface)	™ 8 '	Canister Sampling	Canister ID	1500215] `` **
	Length of probe screen (inches)	6"		Flow controller ID	06806AB	
	Width of probe screen (inches)	0,5'		Pressure gauge ID (optional)	NA	
	Dead volume - including screen, sand pack, and tubing (mL)	146L		Sampling rate or period (mL/min or hours)	6mille	
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	2055		Sample start date and time	1056 श्रेषा	
Probe Purge	Purge rate (mL/min)	200 ml min	1	Initial canister pressure (" Hg)	-28,95	
	Purge start time	1029		Sampling vacuum (" Hg)	. a	
	Purge vacuum (" Hg)	ठ व्हब		Sample completion date and time	8 18/16 1102	
	Purge completion time	1855		Final canister pressure (" Hg)	-3,31	
Helium Leak Check*	Leak check (% or ppmv helium)	0 00000	PMV Pass			•
* The soil gas pro	obe passes the helium leak check if t		(~10 120)			
	less than 1,000 ppm (0 1%). Do NO le helium leak test.	T collect a soil gas sample if				
Weather cond	ditions during sampling:	Sunny 75°				
	THE STATE OF THE S	0	-thi-thered whisie the shall allow men ajon comme was an common succession of the		to the company of the	
Observations	and Comments:	MARINEM LANGUAGE LANG				
				tti 2000-00-10-10-10-10-10-10-10-10-10-10-10-		
			nyanga i api i apin qo aqi an iq-allando-allanda kilonada kalan dik-nadasia sask-alasia sakin		mpayorum ah ahammadada ahaannad	
REV. 11/15/1	1 Stort Lehr	- 29,390 in	Dr3 mate	Helm 31.19	% in shoul	
	1 240 - 11-1	144 2~	in whine	4381		
	1 Sugar	me 1.46 3 po me time 7.3 r	NAC MINIS	71000	Ju	
	1 60,36 101	we like 132	15th 3 No!	mer 9 12 this	wy	



	Project Info			X		W
	Project Name: SE	Backford	MANAGE AND		:678601,ET,01 :81616	
	Site		/X * 操 r		rik distantan	Ø
	Identification: SG-	87	Press Constitutional Constitution in Managemble appropriate principal			_
	Address		ng ar effect his his his distribute and control distribute and other sector recognisions are not as an	THE RESIDENCE AND ADDRESS OF THE PROPERTY OF T	AND	.
	Site Information: Describe ground co	ver <u>C.655</u>				
	· ·	er (feet below ground surface)	AA	PERSON LEGICE LEGICE CONTRACTOR C	18-48-18-18-18-18-18-18-18-18-18-18-18-18-18	١.
	Describe vadose zo	~1	And the second s	типтере форму постоятник инстипивания инс		<u> </u>
	Was a soil boring lo	1. *	Was a pro	bbe diagram completed?	ysk,	
					0 =	_
	Soil Gas Probe Installation	n, Purging, Leak Check	24 2 244 2 3 2 2 2 2	SEH BOT	250000	办
Sample location show in diagram			Field Analysis (optional)	GEM2000 - O2 (%)	18,5/182/18.6	11
robe and Samp	ole SER SC	-83-6816		GEM2000 (Сор. (%)	11/0/0/010	1
aentrication (16 alope	I - "1 \	1				1
nstaliation	a manderved error, start bliss has internal—intellected all and the automobile providers or 1 bell-to			GEM2000 - (2)4/(%)	86/8/9	
	Depth of hole drilled (feet below ground surface)	15,7'		PID - Total VOCs (ppmv)	2:6 214/2.3	1
	Battom of probe screen (feet belo ground surface)	13.4	Canister Sampling	Canister ID	15505255]
	Length of probe screen (inches)	64	100	Flow controller ID	0A33651	
	Width of probe screen (inches)	0,5'		Pressure gauge ID (optional)	NA	
	Dead volume - including screen, sand pack, and tubing (ml.)	1.53		Sampling rate or period (mL/min or hours)	Brin 1	N-PERSON
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	5055		Sample start date and time	1157 8/18/14	
roba Punge	Purge rate (mL/min)	200hlmh		Initial canister pressure (" Hg)	-28,73	
-	Purge start time	11,022		Sampling vacuum (" Hg)	0	1000 1000
	Purge vacuum (" Hg)	0		Sample completion date and time	8/18/18/18/18	
	Purge completion time	1154		Final canister pressure (" Hg)	1203 6-2,	7
Helium Leak Check*	Leak check (% or ppmv helium)	00000	1101 . 181.	tal snokedors	to object who	
The soil gas pro	be passes the helium leak check if t		AZC AGIDA	CAL 50 A.		
	ess than 1,000 ppm (0 1%) Do NO e helium leak lest	Foollect a soil gas sample if				
Weather cond	litions during sampling	Cloudy 80	mouses reverse various program-individuals with 146 ht off-order of a deciding with 200-100-1	ME AN AND PROPERTY OF THE PROPERTY AND	ellikkir nis gindruskrila skalakadrakkikkikkir riki skosiki diktopinyo se, suo suoisven persona e rouse s	
amazinan ayakemilinin kan an darrankad i ke ki	alle i an annard agunjung i an anna a la mandramannan da dwale a lli highe de reference pet hydrogeneted e prevent and reference	<u> </u>	and the second s	ht sale sammens line en syndrome hy al effectionsjon syndroldsskilds gyrjam saysamen; syn yg y gy	THE MET WITH THE THE THE THE THE THE THE THE THE T	
Observations	and Comments:		This shift is been seen as a second s			
6-7-70 P 200-00-01 10 20 20 - 20-14: 14-1-14: 14-1-1	AAAAAA qayaa aaaa AAAA Ahaa ahaa ahaa ahaa ahaa	restriction for the specificality although property and all the public all the selection and balls. And the selection are selected as a selection of the selection and the selection are selected as a selection of the selection and the selection are selected as a selection of the selection are selected as a selection are selected as a selection are selected as a selection of the selection are selected as a selection are sel				
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REV. 11/15/11	1 Achm in Sh	ट किर किन्न	1.9% Che	P 11 ain 1, 4 2 p	provident compa	34
	1 Ruge volvne 3 Pungerate	1,53 L 1 unlum	- nugetine	1657.7 mh	di ameras	
	20	182 1	50.0	₩ 15 × 7 K	Ende hom	٠
	7 Knoke was	110 /				

December 2016



Sheet 1 of

Vapor Intrusion Best Practices Exterior Soil Vapor Probe Installation and Sampling Log - Canister Method

(III) EI FRAN	Project Info	saikhteeshuutiineesa			
	Project Name: SE	Keletord	•		67860).ET.61
	Site			as the subject	
	Identification: Address: Site Information: Describe ground cove Depth to groundwate Describe vadose zon Was a soil boring log	er Sull refeet below ground surface)	NA 1	be diagram completed?	4-3
311 B	Soll Gas Probe Installation	, Purging, Leak Check	king, & Sampling L	og	
Sample location show in diagram			Fleid Analysis MultiRae PID	O2 (%)	18.7
Probe and Samp Identification (fi		SER-56-76-		CO (ppm)	0
Probe Installation	Date and time			H2S (ppm)	0
i	Depth of hole drilled (feet below ground surface)	150	-	IEL (%) CHU	0% LEL=19
	Length of probe screen (inches)	3.6		Total VOCs (ppmv)	0
	Width of probe screen (inches)	3.7	Tedlar Bag Sampling (1	Sample start date and time	
	Dead volume - including screen, sand pack, and tubing (mL)		Liter)	Sampling rate or period (mL/min)	VA
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	2063		Sample completion date and time	
Probe Purge	Helium Conc. In Shroud (%)	21.0	Canister Sampling	Canister ID	15001102
	Purge rate (mL/min)	200		Flow controller ID	OA 00815
	Purge start time	1954		Sampling rate or period (mL/min)	11/6 minutes
	Purge vacuum (" Hg)	0	ŀ	Sample start date and time	0902 12/16
	Purge completion time	W 0901		initial canister pressure (" Hg)	-28,73
Hellum Leak Check*	Leak check (% or ppmv helium)	Oppor		Sampling vacuum (" Hg)	69 BB NA
	Pass or Fail?	5925		Sample completion date and time	0908
concentration In I	prope passes the hamum leak check in the purged soil gas is less than 5% of the shroud. Do NOT collect a soil gas	the measured helium sample if the probe fails the		Final canister pressure (" Hg)	-5,23
Weather cond	litions during sampling:	4;7-35°			11 - 13 - 13 - 14 - 14 - 14 - 14 - 14 -
Observations	and Comments:				
					·····



	Project Info				
	Project Name:	Goch eigh	1		£28/601/E1'0)
	Sampler Name:			Date:	12/10/16
	Site	Tall Statement Statement	ages examples		
	Identification:	76		ki /t mr wsi9.294 si *c*c===a.	
	Address:				1 M-111
	Site Information: Describe ground cov	ver Sloss	1.0		_
	Depth to groundwate	er (feet below ground surface	·		
	Describe vadose zo	ne soil type(s) 500 (previous		
	Was a soil boring lo	g completed?	Was a pro	be diagram completed?	765
				too.	
iample location	Soil Gas Probe Installatio	n, Purging, Leak Chec	Field Analysis	.og	
how in diagram)		MultiRae PID	O2 (%)	18,8
Probe and Samp dentification (fie	le id	5-76-1216		CO (ppm)	0
robe nstallation	Date and time	1]	H2S (ppm)	Ó
	Depth of hole drilled (feet below ground surface)	125		LEL(%) CHZj	0 with GEM
	Length of probe screen (inches)	8		Total VOCs (ppmv)	0.1
	Width of probe screen (inches)	10	Tedlar Bag Sampling (1	Sample start date and time	827-9V.
	Dead volume - including screen, sand pack, and tubing (mL)		Liter)	Sampling rate or period (mL/min)	NA
fanifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	Pass		Sample completion date and time	M
robe Purge	Hellum Conc. In Shroud (%)	22.3%	Canister Sampling	Canister ID	12001923
	Purge rate (mL/min)	200]	Flow controller ID	0A02110
	Purge start time	0813		Sampling rate or period (mL/min)	14/6min
	Purge vacuum (" Hg)]	Sample start date and time	7827 12/1
	Purge completion time	0821		Initial canister pressure (" Hg)	-28.61
Hellum Leak Check*	Leak check (% or ppmv helium)	Vaggo]	Sampling vacuum (" Hg)	NA
	Pass or Fail?	کمحح		Sample completion date and time	0833
	rope passes the helium leak check i he purged soil gas is less than 5% of		-	Final canister pressure	225
concentration in the nelium leak test.	he shroud. Do NOT collect a soil ga	s sample if the probe fails the	,	(* Hg)	-2.25
	illogo dessino accomitante	12/2 3/00			
veauer cond	itions during sampling:	John J.			
		-	-:		
Observations	and Comments: Local	min is an	yth run	of scomming	71911 a Where
	* * * * * * * * * * * * * * * * * * * *		1N		•
REV. 5/10/16		_			



	Project Info				
	Project Name: SF	Rockind		Project # :	678601 (ETBO)
			•	Date:	1311111
	Site				
	Identification: 56-77 Address: Site Information:				
	Describe ground cover Depth to groundwater	(feet below ground surface)	NA		
	Describe vadose zone Was a soil boring log	tw.	Was a pro	be diagram completed?	ye.s
		- - 0			
	Soil Gas Probe Installation	, Purging, Leak Check	ing, & Sampling L	og	
Sample location show in diagram			Field Analysis MultiRae PID	O2 (%)	16.2
Probe and Samp Identification (fle	ole old (D) 56-77/	SER-516-76-1	2H	CO (ppm)	٥
Probe Installation	Date and time			H2S (ppm)	0
	Depth of hole drilled (feet below ground surface)			LEL (%) CH4	O WITH GEM
	Length of probe screen (inches)	e Ce		Total VOCs (ppmv)	0.1
	Width of probe screen (inches)	CVICA	Tediar Bag Sampling (1	Sample start date and time	
	Dead volume - including screen, sand pack, and tubing (mL)		Liter)	Sampling rate or period (mL/min)	Z A
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	2035		Sample completion date and time	1
Probe Purge	Helium Conc. In Shroud (%)	24.1	Canister Sampling	Canister ID	150 or 14-17 150 deats
	Purge rate (mL/min)	200		Flow controller ID	040253 0A01319
	Purge start time	0957		Sampling rate or period (mL/min)	145min 145mi
	Purge vacuum (" Hg)	<u></u>		Sample start date and time	12/1/168 12/1/168
	Purge completion time	1007		Initial canister pressure	-24.66 -28.66
Hellum Leak Check*	Leak check (% or ppmv helium)	ل معرم ٥		Sampling vacuum (" Hg)	NA NA
	Pass or Fail?	20155		Sample completion date and time	1013 1013
concentration in ti	rope passes the helium leak check in the purged soil gas is less than 5% of the shroud. Do NOT collect a soil gas	he measured helium		Final canister pressure (" Hg)	-7,81 -6,80
Weather cond	itions during sampling:	27 35°			
Observations	and Comments: Durage	V5)UNC 3X	- 1.56		
	3	AS AL ALCA	113 €		



	Project Info		elizanii eliniy		Burding Residen
	Project Name: SER	sekt rd		Project #	:618601 (ET.O)
	Sampler Name			Date	12/1/4
de tols (a)	Site				Rowing State of Co.
	Identification: SS-75 Address: Site Information: Describe ground cov	er <u> </u>	25		
	Describe vadose zo: Was a soil boring log	1 45	Was a pro	obe diagram completed?	
	Soil Gas Probe Installation	, Purging, Leak Check	ing, & Sampling I	.og	
ample location how in diagran	(describe and n)		Field Analysis MultiRae PID	02 (%)	2.6
robe and Sam; dentification (fi	ole SER ST	-28-1514		CO (ppm)	0
robe nstallation	Date and time			H2S (ppm)	0
	Depth of hole drilled (feet below ground surface)	18		LEL (%)	19
	Length of probe screen (inches)	e,		Total VOCs (ppmv)	16,1
	Width of probe screen (inches)	2	Tedlar Bag Sampling (1	Sample start date and time	
	Dead volume - Including screen, sand pack, and tubing (mL)		Liter)	Sampling rate or period (mL/min)	
ianifold Leak heck	Leak check (sampling manifold) - Pass/No Pass	70055		Sample completion date and time	
robe Purge	Helium Conc. In Shroud (%)	32479	Canister Sampling	Canister ID	1501210
	Purge rate (mL/min)	200		Flow controller ID	OAOHIR
	Purge start time	1034		Sampling rate or period (mL/min)	16 mins
	Purge vacuum (* Hg)	0		Sample start date and time	1042 /2/1/16
	Purge completion time	1041		Initial canister pressure (* Hg)	J8138 @
elium Leak heck*	Leak check (% or ppmv helium)	ORMV		Sampling vacuum (* Hg)	NA
	Pass or Fail?	5-21		Sample completion date and time	1048 12/1/18
oncentration in t	Nove passes the netium teak check it he purged soil gas is less than 5% of he shroud. Do NOT collect a soil gas	the measured helium		Final canister pressure (* Hg)	1048 la/1/h
Veather cond	litions during sampling:	ouly 35°			
Observations	and Comments:	% COS 1.	7 /61	No Mester	ville Malla
7) 14	Le continue!	h. CFWI	mutika		



	Project Name: SF Rockeford Sampler Name:			Project # : 678 Co 1 FT (01) Date:		
				Date:		
	Site					27
	Identification: SG-8	3.0				
	Site Information:					
	Describe ground co	ver Glevic				
	Depth to groundwate	er (feet below ground surface)	<u>w</u>			
	Describe vadose zo	ne soil type(s)				
	Was a soil boring to	g completed?	Was a pro	obe diagram completed?	yes	
					<u> </u>	
	Soil Gas Probe Installatio	n, Purging, Leak Check	ing, & Sampling I	-og	1 6 5	
iample location how in diagram	n)		Field Analysis MultiRae PID	Q2 (%)	16.6	18.5
Probe and Samp dentification (fi	ole SER-SI	·80-124		CO (ppm)	ه	٥
robe nstallation	Date and time			H2S (ppm)	٥	0
	Depth of hole drilled (feet below ground surface)	\ _		LEL (%) GEM	6	17. GCM
	Length of probe screen (inches)	pice		Total VOCs (ppmv)	0.1	1.6
	Width of probe screen (inches)	7,27	Tedlar Bag Sampling (1 Liter)	Sample start date and time		
	Dead volume - including screen, sand pack, and tubing (mL)		Litery	Sampling rate or period (mL/min)		
fanifold Leak iheck	Leak check (sampling manifold) - Pass/No Pass	7205		Sample completion date and time		
Probe Purge	Helium Conc. In Shroud (%)	27.22	Canister Sampling	Canister ID) S C	00959
	Purge rate (mL/min)	200		Flow controller ID	OAO	1769
	Purge start time	1332		Sampling rate or period (mL/min)	14 5	Min 28
	Purge vacuum (" Hg)	0+2-8		Sample start date and time	121111	, 1428
	Purge completion time	1321420		Initial canister pressure (" Hg)	-28.	66
fellum Leak Check*	Leak check (% or ppmv helium)	NW5200		Sampling vacuum (" Hg)	0 70	-8
	Pass or Fail?	7255		Sample completion date and time	1451	
oncentration in t	wooe passes the nellum leak check the purged soil gas is less than 5% of he shroud. Do NOT collect a soil gate	f the measured helium		Final canister pressure	-6,7°	5
Neather cond	litions during sampling: Clo	ich do'nle				

Observations and Comments: D. Pote was purple of 3 volumes by purgen probe with prim?

Until Vaccum was C approx -8. Pump wis stopped and aftern potential allowed to recharge bould down to 2000. The pump has then turned on and the pote was 2 word again to -9. The PREV. 5/10/16 registed until 3 poter D where was removed (D 1.74 Litter) After it of purge as was ormand, a second enorty bas was plucified on pote cut let. Purgerial Conflict at 3 prote Nolves was purged. The belown was started a liminate prior to St. it of purgings How cinc. It in shrough was checkette confirm thems above 2020.

Progr Log for 56-80 (Vacum) Stort Purge (0) 13:30 13 32 13 97 Stat Pricy (0) 1339 Stop Purje (-8) Stut Purge (0) 1344 Stop Purge (-8) 1346 Stort Purge (0) 1350 \$ Stor Purge(-8) 1353 Start Purge (0) 1358 >1/L Purget change Tellar bag Stoz Purge (-8) 1406 Nohe lum detectation purge gos Start Purge (0) 1405 Stop Purge (-8) 1407 1413 Stat-Punge (0) 1415 Stopphycl-8) Stad Puse(D) 1420 Stor Prog(8) ___ O.74 Liter Progel. Stor zurge, 1422 No helin Tellar bag Okto sough, Pake not leaking, Herefore he hum not regulared Jun samply 1428 - Stat Sample, Canistor Value opened and constrational to fill until vocum gavor was & -8. Value closed and pole allowed to recharge. Constr need &4 cycles to t.ll



	Project Info			Dayler Version Street	STANCE AND ADMINISTRA	
	Project Name: SE Rockto	rd		Project#	:678 601, ET. 01	
	Sampler Name:		· · · · · · · · · · · · · · · · · · ·		: 12/1/16	
	Site		A DATE OF STREET			28
	Identification: 56-81		1	CONTRACT TO	: +1	
	Address: Site Information:					
	Describe ground cover	9 1952				
	Depth to groundwater (feet below (NA.		**************************************	
	Describe vadose zone soil type(s)					
	Was a soil boring log completed?	Ac1	Was a pro	be diagram completed?	g <u>es </u>	
	Soil Gas Probe Installation, Purging,	Leak Checkin	a. & Samplina L	DO.		ir.
Sample location	(describe and		Field Analysis	02 (%)	78/18/1/24	110-118
show in diagram Probe and Samp		1	MultiRae PID		78110161187	10, / /
Identification (fig	1010) SER-(\$-81-121	6		CO (ppm)	0000	0/6
Probe Installation	Date and time			H2S (ppm)	000	9 0
	Depth of hole drilled (feet below ground surface)	· -		LEL (%) WITH GEM	0 600 0	8110
	Length of probe screen (inches)			Total VOCs	0,10,10	3/13
	Width of probe screen (inches)	1/6/	Tedlar Bag	(ppmv) Sample start	12.10.101.	
	Dead volume - including screen,	3	Sampling (1 Liter)	date and time Sampling rate or period		1/37
	sand pack, and tubing (mt.)			(mL/min)		0.75
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	, ,		Sample completion date and time		
Probe Purge	Helium Conc. In Shroud (%)	1%	Canister Sampling	Canister ID	15C01275	1
1	Purge rate (mL/min)			Flow controller ID	DA 21671	
	Purge start time //24			Sampling rate or period (mL/min)	16/14/1/20	
	Purge vacuum (* Hg)			Sample start	11-1 12/11	
				date and time	1156 3711	
Hellum Leak	Purge completion time			(" Hg)	-38.69	****
Check*	Leak check (% or ppmv helium)	155ml		Sampling vacuum (" Hg)	A/A	
	Pass or Fail?	۷		Sample completion date and time	1200 12/1/14	
	Robe passes the neitum teak check if the measured					-
concentration in ti	he purged soil gas is less than 5% of the measured he shroud. Do NOT collect a soil gas sample if the			Final canister pressure (* Hg)	-2.10	
helium leak test.	01 1	000				_
Weather cond	itions during sampling:	<u> </u>				
		199 191				1
Observations	and Comments: 3x Purない	al ymp =	4.5 /1	ics. No habo	-dardering	any oddy
	Tidh Dys	Charkal-				V
REV. 5/10/16	Pobe posuored 11	TO IL	bog of	TT Oby Hax	Filled, a seco	items bro
	bas we shall a		117	J bad	filled, a seco	1 1 1 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1
	bag was poxed on p	טס קמעי	licit Ea	ch bod was	SCREINJI WIT	re helia
	detator / 1-1/11/100000 (Sien		0		



	Project Info			Marie Espe				
	Project Name: SE	kuckturel.			Project #	: 17/11/ : 28 601	FIOI	
	Site	(中国) 10 人工 · · · · · · · · · · · · · · · · · ·	p G					i
	Describe vadose zo Was a soil boring lo	ver Coss er (feet below ground surface one soil type(s) g completed? Lys)		be diagram completed?	Lips		
Sample location	Soil Gas Probe Installatio	n, Purging, Leak Chec	king		og	There by	THE PART AND DESCRIPTION OF THE PARTY OF THE	1
show in diagram Probe and Samp Identification (file)	9-101-		Field Analysis MultiRae PID	O2 (%) CO (ppm)	17,41	7,3173	17.4/17.4
Probe Installation	Date and time Depth of hole drilled (feet below ground surface)	1		:	H2S (ppm) LEL (%)	0 0	00	0
	Length of probe screen (inches)	3/6		Talla Bas	Total VOCs (ppmv)	00	50	S
	Width of probe screen (inches) Dead volume - including screen, sand pack, and tubing (mL)	100		Tedlar Bag Sampling (1 Liter)	Sample start date and time Sampling rate or period (mL/min)			1
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	2022			Sample completion date and time			
Probe Purge	Helium Conc. In Shroud (%)	26,5%		Canister Sampling	Canister ID	1500	1123	
	Purge rate (mL/mln)	300			Flow controller ID	0A01	213	
	Purge start time	1220			Sampling rate or period (mL/min) Sample start	1145	ninutes	
	Purge vacuum (" Hg) Purge completion time	0			date and time Initial canister pressure	1257	12/11/1	
Hellum Leak Check*	Leak check (% or ppmv helium)	0/1257	V		(" Hg) Sampling vacuum (" Hg)	NA -78.63	>	
	Pass or Fail?	2720			Sample completion date and time	12/1/16 6	0 1302	
concentration in the	obe passes the nemum reak check it le purged soil gas is less than 5% of le shroud. Do NOT collect a soil gas	the measured helium			Final canister pressure (" Hg)	-68	si" fla	
Weather condi	tions during sampling: Clc	Wz 40				711111		
~ ì	ac V n	3=4,591 g. After one reend with	が、	Porn V. as filled	na sound or	neto bag		ed or pump

Attachment 5 Building Survey Forms

August 2016

Property 6 (Residential Property)

ch2m:

Building Survey - Indoor Air Sampling

Project Information	Page 1 of 4
Project Name: SR Rockford	Project #: 67860), ET-0)
Survey Completed By:	Date: \$ 19 11 L
Building Address:	Residence ID: Nt
Resident and Contact Information	
Name of Occupant:	Owner / Tenant / Other:
Occupant Phone #s: Home: Work:	Cell
	Best Time To Call / Visit:
Number of Building Occupants:Children (list ages):	Adults:
(If Rental) Property Owner Name.	Owner Phone #s: Home:
Owner Address:	Work:
Name of Interviewee for Building Survey:	Notes:
Building Construction Characteristics	
Building Type: (Check box for all that apply) Single for by Residid	or Second floor Segorate Azt
Single Family Residential Ranch Split Level	Duplex (# of other half of duplex):
Multi Family Residential Two-story Tri Level	Apartment (# of units in Building):
Commercial Other (specify):	
Describe Building: (General Description, Construction Materials, etc.)	win Sidney
Unt	g Space sq.ft. First Floor: Sq.ft.
Approximate Age: years Approximate Area: Total Living	1900
Floors: # Floors at or above grade:	15t4 Secal - Second Plan seconda Resid
Which floors of the residence are utilized as living space / occupied?	13(1 SCOT) GEORGIA (BS) of SCOT
Foundation Type: Foundation Description: (Split Foundation	on or Multiple Types)
Crawl Space: Yes No Unknown	
Slab on Grade: Yes No	07
Basement: Yes / No Slab & Crawl Space Construction:	Congrett
Basement or Crawl Space Details: (if applicable)	
Finished Basement: Yes / No Basement Finished When:	Approximate Area: 906 sq.ft.
Basement or Crawl Space Floor: (Check box for all that apply)	
Concrete Dirt Floating	Other (specify):
(built on top of actual floor))
Foundation Walls: (Check box for all that apply)	
Poured Concrete Block Stone	Other (specify):
Does the basement or crawl space have a moisture problem - dampness? (Check	conly one)
	es, rarely ess than 1 time/year)
(3 or more times/year) (1-2 times/year) (1-2 times/year) (1-2 times/year)	out that I divid year,
	es, rarely No
Too, hequeinay	es, rarely No ess than 1 time/year)

Basement or Crawl Space Details Continued: (if applicable) Does the basement have any of the following? (Check all that apply) Floor cracks
Does the basement have any of the following? (Check all that apply) Floor cracks
Floor cracks Wall cracks Floor Drain Sump pump
Other hole / opening in floor (describe): Is the sump pump used? Yes / No Depth of sump? ft Where does the sump pump drain? Describe ventilation of crawl space:
Other hole / opening in floor (describe): Filted with which
Describe ventilation of crawl space: Describtion of ground cover outside of building: Grass Concrete Asphalt Other: Heating & Ventilation Systems Heating System - Fuel Type: (Check box for all that apply) Natural Gas Wood Other (specify): Heating - Conveyance System: (Check box for all that apply) Forced Hot Air Forced Hot Water Hot Water Radiation Other (specify): Type of Ventilation System: (Check box for all that apply) Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Window Air Conditioning Window Air Conditioners Where does the sump pump drain? Other: Asphalt Other: Other: Wood Stove Fireplace Kerosene Heater Kerosene Heater Other (specify): Type of Ventilation System: (Check box for all that apply) Central Air Conditioning: Other (specify): Other(specify): Other(specify): Other(specify): Other(specify):
Describte ventilation of crawl space:
Description of ground cover outside of building: Grass Concrete Asphalt Other: Ot
Heating & Ventilation Systems Heating System - Fuel Type: (Check box for all that apply) Natural Gas
Heating System - Fuel Type: (Check box for all that apply) Natural Gas
Natural Gas Wood Wood Other (specify): Heating - Conveyance System: (Check box for all that apply) Forced Hot Air Forced Hot Water Other (specify): Type of Ventilation System: (Check box for all that apply) Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify):
Wood Other (specify): Heating - Conveyance System: (Check box for all that apply) Forced Hot Air Electric Baseboard Hot Water Radiation Other (specify): Type of Ventilation System: (Check box for all that apply) Central air handler / blower Mechanical / ceiling fans Bathroom ventilation fans Air-to-air heat exchanger Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify):
Heating - Conveyance System: (Check box for all that apply) Forced Hot Air Forced Hot Water Other (specify): Type of Ventilation System: (Check box for all that apply) Central air handler / blower Kitchen range hood fan Central Air Conditioning: (Check box for all that apply) Central Air Conditioning Wood Stove Heat Pump Kerosene Heater Heat Pump Bathroom ventilation fans Air-to-air heat exchanger Other (specify): Central Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): Other (specify):
Forced Hot Air Forced Hot Water Other (specify): Type of Ventilation System: (Check box for all that apply) Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Wood Stove Heat Pump Kerosene Heater Kerosene Heater Kerosene Heater Kerosene Heater Kerosene Heater Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): Other (specify): Other (specify):
Forced Hot Water Other (specify): Type of Ventilation System: (Check box for all that apply) Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): Other (specify): Other (specify): Other (specify): Other (specify):
Forced Hot Water Other (specify): Type of Ventilation System: (Check box for all that apply) Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): Other (specify): Other (specify): Other (specify): Other (specify):
Other (specify): Type of Ventilation System: (Check box for all that apply) Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): Other (specify): Other (specify):
Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): Other (specify): Other (specify): Other (specify):
Central air handler / blower Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): Other (specify): Other (specify):
Kitchen range hood fan Other (specify): Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): Air Carait, sna.
Does the Residence have Air Conditioning: (Check box for all that apply) Central Air Conditioning Window Air Conditioners Other (specify): MAIT Carbitany:
Central Air Conditioning Window Air Conditioners Other(specify): No Air Carbit, en
Describe the current operating conditions of the HVAC system:
Miscellaneous Information
Does the Residence have any of the following?
Septic System? Yes / Yes (but not used) /No Irrigation / Private Well?
Existing subsurface depressurization (radon) system in place? Yes / Yo Is it running? Yes / No
Is there standing water outside the residence (pond, ditch, swale)? Yes / No If so, describe:
Has the residence been retrofitted / weatherized with any of the following? (Check box for all that apply)
Insulation Storm Windows Energy-efficient windows Other (specify):
Does the building have an attached garage? Yes / No If so, is a car usually parked in the garage? Yes / No Alfa
Chemicals
Have any pesticides / herbicides been applied around the building foundation or in the yard / gardens? Yes / No
If so, when - and which chemicals?
Has the residence had a pesticide treatment inside? Yes / No When / by whom?
Do the occupants of the building have their clothes dry-cleaned? Yes / No
When were dry-cleaned clothes last brought into the building?
Have the occupants ever noticed any unusual odors in the building? Yes / No Describe (with location):

Page 3 of 4
Building Address: Date:
Have there been any known spills of a chemical immediately outside or inside the building? Describe (with location): Describe (
Consumer Products Inventory
heck consumer products that are present in the residence.
Paint or Wood Finishes (spray or can) Paint stripper / remover / thinner Solvent cleaners (e.g., spray-on oven cleaner) Metal degreaser / cleaner Gasoline / diesel fuel Glues or adhesives (super glue, etc.) Air fer sheners & scented candles Laundry / carpet spot removers Pesticides / Insecticides Nall polish remover (acetone) Aerosols (degdorizers, polish, cleaners) Other: Ot
Describe any products that are containerized during sampling events No exercise that the container
Provide any additional information that is provided by interviewee: 13 gallons Latzy Paint in basent No PID Readings WeitReman

Building Address:			Date: 89	Page 4 of 4
Building Sketch				
Provide sketch of floors in house, includi	ng the following information:			
Street (sidewalk, patios, driveway	, distance to house)	Primary chemical	storage location(s)	
Location of heating and cooling sy	stems, including fireplace	General orientation	on of garage and main rooms	
General location of doors and win	dows			
		301		N
	Furn			
Boscot 106-448 725 1.7 0.08 ppl		A		
Doscur	1 S. 12, HALL	rs)	197-6	
06-448 3-5	35-04-01		- 0	
1.7 000	22-04		55050	Crow
273 00.0		25 /	CICM!	STACE
			(50	C
			-2	MARKE
			Floar	Covers
			ואריוכו	-card port
		00		
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Insher BDra	en Chall	datur.
	4		The state of the s	Stora
	4012	علاو المارح		P-1
Clony			13.10	1 30
C10340	T'RES BUA	V 4 1	Master 10	300
01-31000			1 (300 (UV)	
	The street			
1 552 1 5ª Y	A KOLL		IVYY KOGY	17744 3018
6 Dillemk	of Kitiche		106 336	
			مرکو کی کی ا	Y - / - 4,
	0.0=11.			
Post Sampling Review	- 346 = 10	16	10.00	A
Date Noted: Shill	13	Sampling Tealm:		
Has any information changed during th		1		
Did windows and doors remain closed	, NA Ozenni	مهم ومه		
Was any dry cleaning brought home?	No			
Were any of the consumer products di	- 1 0	24-hours? \(\delta \de		
Were any of the containerized product				
Notes / other information observed pos	t-sampling: Smoke	المساكرة ب	OVER NO AC	open While
		U		'

R

Property 5 (Commercial Property)

Preliminary Building Survey for Vapor Intrusion InvestigationPage 1 of 5

Date: Ch2m Preparer: Facility: Address: Contact Person: Phone Number: e-mail address: **Building Description** Building or Room Identifier: Primary Activity within Building (select one): Storage Manufacturing **Chemical Storage** Chemical processing Instrumentation/Control Administrative Historical Activities within Building (if different from aboye): Notes: Bosent - Only Porte tracks Approximate floor space Mai terma with 2007 Ploors Number of floors Multi-room building or Single room 10-20 in montance Area in offices Ceiling height Concrete Wood **Aboveground Construction** Cinderblock **Brick** Other

2948 7,348

de de la constante de la const

Preliminary Building Survey for Vapor Intrusion InvestigationPage 2 of 5

Evaluation of Potential Conduits	from Soil		and revised 1/17/11 KAS	1.
Floor/foundation description (check all t	ibat anni N	Toge of do	ck arth-salbert 190	30
		il usta	مدا کم	
Wood X Co	oncrete		ed above grade?	<i>5</i>
Other Brid	1_		ove grade: 3-4	
outer Division		Feet ab	grade? ove grade: VNb	Million
		1. 6	n grade? \\O')	عن من
Expansion joints present (if concrete floor)?	Yes	No	N/A	
Are expansion joints sealed?	Yes	No	N/A Filledy	h
Are sumps or floor drains present?	Yes	No	N/A	
Are basements or subsurface vaults present?	Yes	No	N/A	
Are there subsurface drainage problems?	Yes	No	N/A	
Notes/Explanation for N/A responses:	Concento	in mainte	nce oftens cover	al with
Evaluation of Potential Pathways	/Driving Forces			
Are there locations with elevated positive	- .	re (look for doors n	ot opening/closing property	
perceptible airflow, audible fan noise)	o or megative pressu	10 (100K 101 0001311	or opening/closing property,	
None Notices		1	L.	

Preliminary Building Survey for Vapor Intrusion Investigation

Page 3 of 5

Is there one air conditioning zone or multiple zones (if in a multi-room bu	illding)? Dock	ares are	net sort
Is there one air conditioning zone or multiple zones (Single zone Multi-zon	ie	Other of AC	· Have Cerly	Heating
office Area South	urrace + Ac	Forced Air	0	
(building management may know; another tip-off is	the presence of mult	iple thermostats = n	nultiple zones)	
Sources of outdoor air				
Mechanical (air handling unit)	X	Doors		
Windows		Attic Fans NO.		
Are windows/doors left open routinely?	Yes	No		
Notes:				
Evaluation of Potential Existing Chemical S Chancel Solvent or VOC-containing products us Are any of the target analytes used in this building/	Sources Indoors	walahla) Rah	7 N OBN	
Dist principal solvent or voc-containing products us	Jash majng	muchen	als Na PI	DReading
			containe	1 D
Are any of the target analytes used in this building/	room?	—— 4°	500 (S)	2261
Are any of the target analytes used in this sanding,		0, 0	was Mapin	Remove
Yes No			O	
Are pesticides used indoors for pest control?		Yes	No	
Names of pesticide products used?	No			
Has there been a pesticide application within the				
past 6 months? Ser Rive Ebb Lias		Yes	No	=
Is smoking permitted in the building?		Yes	No	

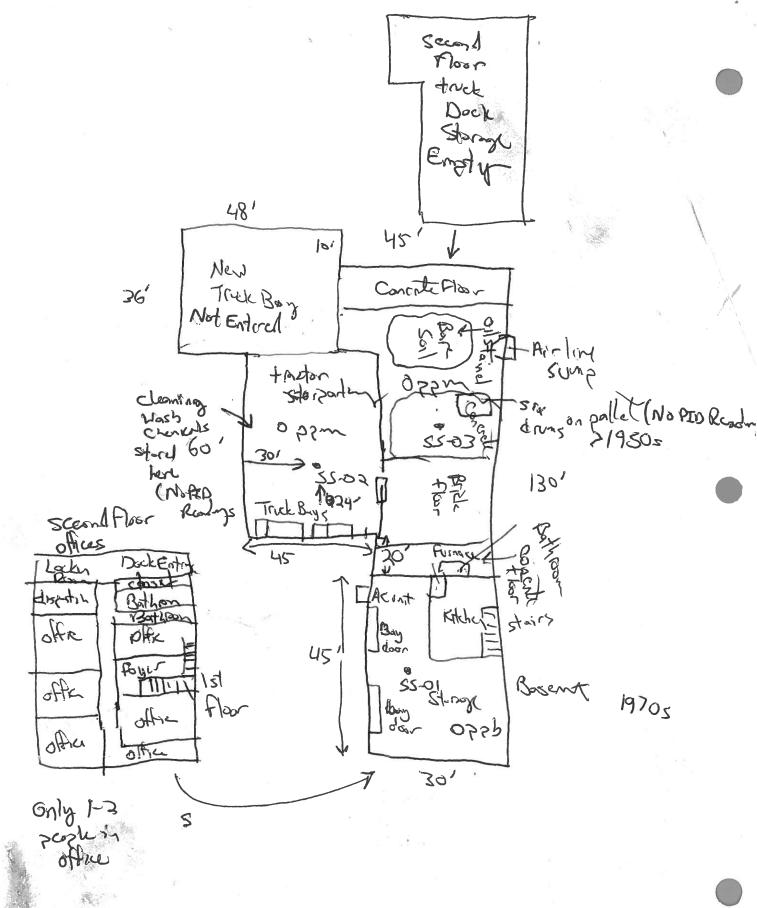
Preliminary Building Survey for Vapor Intrusion Investigation

Page 4 of 5

Description of Vapor	Mitigation Systems	
Has a radon or vapor miti building/room?	gation system been installed in this	Yes No
Date of installation?	NH	
Type of system?	Passive venting	Active subslab depressurization
	Crack/crevice sealing	Dilution ventilation control
	□ N/A/A	
Notes		
		4
41.		

Preliminary Building Survey for Vapor Intrusion InvestigationPage 5 of 5

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and the same of th

February 2017



Building Survey - Indoor Air Sampling

Project Information	Page 1 of 4
Project Name: SE Rock Ford	Project #: 215 32 678601, ET.01
Survey Completed By:	Date: 2/15/17
Building Address:	Residence ID: PVozoto 3
Resident and Contact Information	
Name of Occupan	Owner / Tenant / Other:
Occupant Phone #s; Home: Work:	Cell
Duration at Current Residence:	Best Time To Call / Visit:
Number of Building Occupants: Children (list ages):	Adults:
(If Rental) Property Owner Name:	Owner Phone #s: Home:
Owner Address:	Work:
Name of Interviewee for Building Survey	Notes:
Building Construction Characteristics	
Building Type: (Check box for all that apply)	
Single Family Residential Ranch Split Level	Duplex (# of other half of duplex):
Multi Family Residential Two-story Tri Level	Apartment (# of units in Building):
Commercial Other (specify):	
Describe Building: (General Description, Construction Materials, etc.)	
Approximate Age: Unit years Approximate Area: Total Livin	ng Space: 40 x 20 sq.ft. First Floor: 40 x 38 sq.ft.
Floors: # Floors at or above grade:	
Which floors of the residence are utilized as living space / occupied?	Both Bount 1st Plan
Foundation Type: Foundation Description: (Split Foundat	tion or Muttiple Types)
Crawl Space: Yes / No Concrete	
Slab on Grade: Yes / No	
Basement: Yes / No Slab & Crawl Space Construction:	Concrete
Basement or Crawl Space Details: (if applicable)	15
Finished Basement: Ves No Basement Finished When:	Approximate Area: 40×30 sq.ft.
Basement or Crawl Space Floor: (Check box for all that apply)	
Concrete Dirt Floating	Other (specify):
(built on top of actual floor	r)
Foundation Walls: (Check box for all that apply)	
Poured Concrete Block Stone	Other (specify):
Does the basement or crawl space have a moisture problem - dampness? (Check	c only one)
	es, rarely ess than 1 time/year) No
is the basement or crawl space ever wet - flooded? (Check only one)	
	es, rarely ess than 1 time/year) No

Building Survey Page 2 of 4
Building Address: Part 3 Date: 2/15/17
Basement or Crawi Space Details Continued: (If applicable)
Does the basement have any of the following? (Check all that apply)
Floor cracks Wall cracks Sump pump
Other hole / opening in floor (describe):
Is the sump pump used? Yes / No Depth of sump? Where does the sump pump drain?
Describe ventilation of crawl space: 1/07/
Description of ground cover outside of building: Grass Concrete Asphalt Other:
Heating & Ventilation Systems
Heating System - Fuel Type: (Check box for all that apply)
Natural Gas Electric Coal Fuel Oil
Wood Other (specify):
Heating - Conveyance System: (Check box for all that apply)
Forced Hot Air Electric Baseboard Wood Stove Fireplace
Forced Hot Water Hot Water Radiation Heat Pump Kerosene Heater
Other (specify):
Type of Ventilation System: (Check box for all that apply)
Central air handler / blower Mechanical / ceiling fans Bathroom ventilation fans Air-to-air heat exchanger
Kitchen range hood fan Other (specify):
Does the Residence have Air Conditioning: (Check box for all that apply)
Central Air Conditioning Window Air Conditioners Other (specify): Describe the current operating conditions of the HVAC system:
Describe the Current Operating Continuous of the FFFAC system.
Miscellaneous Information
Does the Residence have any of the following? Seetin Suntant? You (Yee that pot used) / No. Intention / Private Well?
Septic System? Test Pack Total Used) 7 NO
Is there standing water outside the residence (pond, ditch, swale)? Yes / No If so, describe: Has the residence been retrofitted / weather/zed with any of the following? (Check box for all that apply)
Insulation Storm Windows Energy-efficient windows Other (specify):
Does the building have an attached garage? Yes / No tf so, is a car usually parked in the garage? Yes / No
Chemicals
Have any pesticides / herbicides been applied around the building foundation or in the yard / gardens? Yes / No
If so, when - and which chemicals?
Has the residence had a pesticide treatment inside? Yes No When / by whom?
Do the occupants of the building have their clothes dry-cleaned?
When were dry-cleaned clothes last brought into the building?
Have the occupants ever noticed any unusual odors in the building? Yes / (No) Describe (with location):

Building Survey Page 3 of 4
Building Address: Popul 3 Date: 2/15/017
Miscellaneous Information Continued: Have there been any known spills of a chemical immediately outside or Inside the building? Describe (with location):
Do any of the occupants smoke inside the building? Yes / No Are their clothes washed at home? Yes / No If so, when - and what rooms? Within the last 6 months, has there been any painting or remodeling in the residence? Within the last 6 months, has any new carpeting been installed? Yes / No How often? Yes / No If so, when Have the carpets or rugs been cleaned? Yes / No If so, when, what rooms, and what cleaners?
Consumer Products Inventory
Check consumer products that are present in the residence.
Paint or Wood Finlahes (spray or can) Paint stripper / remover / thinner No Solvent cleaners (e.g., spray-on oven cleaner) Metal degreaser / cleaner No Gasoline / diesel fuel No Air fresheners & scented candles No Laundry / carpet spot removers Pesticides / Insecticides No Nail polish remover (acetone) Aerosols (deodorizers, polish, cleaners) Other: Other:
Describe any products that are containerized during sampling event: \text{One} - No Vocs
Provide any additional information that is provided by interviewee:

Building Sketch	Carlon Bell Dura (Dar China) La Labora de Carlon de Carlon De Carlon Ca
Provide sketch of floors in house, including the following information:	
Street (sidewalk, patios, driveway, distance to house)	Primary chemical storage location(s)
Location of heating and cooling systems, including fireplace	General orientation of garage and main rooms
General location of doors and windows	
8 530 805 Landy 83 5	30 Food Pood in
1 (OSUM) A LAVIEL IS	178 R.J.
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DW DW	H 031/6
S\$ 108 OFF 187	
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18dran, throng	De (0,990)
11 11 10 10 20	0 9 7
(2) (2) (2)	SS-04
W THE RESERVE TO THE	
40	Closet
<u> </u>	36
Bedan	there
	1377
1322	Sales I Cara
Bredian Or I am	(1905/20)
Manya Too	TA 26 4 12 12 304
	20 1388
	THE PARTY OF THE P
Note - pop Rove Rendrie 10 porte	The set taken a day of smale
	Last later of add of southers
Post Sampling Review	
Date Noted: 3/23/17	Sampling Team:
Has any information changed during the sampling event?	3
Did windows and doors remain closed?	
Was any dry cleaning brought home?	a last 24-hours? No
Were any of the consumer products discussed yesterday used in the Were any of the containerized products opened?	I III ZALIVIII I
Notes / other information observed post-sampling:	
The same and the same and same	10 10 10 10 10 10 10 10 10 10 10 10 10 1

Property 4



Building Survey - Indoor Air Sampling

Project information	Page 1 of 4
Project Name: S. F. Rockford	Project #: 6786
Survey Completed By:	Date: 2/15/17
Building Address:	Residence ID: Post 4
Resident and Contact Information	
Name of Occupant	
Occupant Phone #s: Home: Work:	(Owner / Tenant / Other:
D. and an	Cell:
Number of Building Occupants: Children (list ages):	
(If Rental) Property Owner Name:	Adulte:
Owner Address:	Owner Phone #s: Home: Work:
Name of Interviewee for Building Survey:	Notes:
Building Construction Characteristics	
Building Type: (Check box for all that apply)	
	7
Single Family Residential Ranch Split Level Multi Family Residential Two-story Tri Level	Duplex (# of other half of duplex):
Commercial Other (specify):	Apartment (# of units in Building):
	Roich
Describe Building: (General Description, Construction Materials, etc.)	2 1/4 01
Approximate Age: 105 years Approximate Area: Total Living Sp	pace: Dant Khr. First Floor: sq.ft.
Floors: #Floors at or above grade: USTHOOF Between	30,40
Which floors of the residence are utilized as tiving space / occupied?	B-11
Foundation Type: Foundation Description: (Split Foundation or	r Multiple Types)
Crawl Space: Yes / No Concrete	
Slab on Grade: Yes / No	
Basement: Yes No Slab & Crawl Space Construction:	oncite
Basement or Crawl Space Details: (if applicable)	: 1
Einished Basement: Yes / No Basement Finished When: U.S.	J VNK now Approximate Area: 30 440 eq.ft.
Basement or Crawl Space Floor: (Check box for all that apply)	
Concrete Dirt Floating	Other (specify):
(built on top of actual floor)	
Foundation Walls: (Check box for all that apply)	
Poured Concrete Block Stone	Other (specify):
Does the basement or crawl space have a moisture problem - dampness? (Check only	
Yes, frequently (3 or more times/year) Yes, occasionally (1-2 times/year) Yes, rar (less the	one) rely an 1 time/year) No
Is the basement or crawl space ever wet - <u>flooded</u> ? (Check only one)	
Yes, frequently Yes, occasionally Yes, rar	mb. DX 1
	an 1 time/year) No

Building Survey	Page 2 of 4
Building Address:	Date: 2(15/) 7
Basement or Crawl Space Details Continued: (If applicable)	
Does the basement have any of the following? (Check all that apply)	\ .
Floor cracks Wall cracks Floor Drain	Sump pump
	4
Other hole / opening in floor (describe): Is the sump pump used? Yes / No Depth of sump? 3 ft	Where does the sump pump drain?
Describe ventilation of crawl space:	V
Description of ground cover outside of building: K Grass Concre	te Asphalt Other:
Heating & Ventilation Systems	
Heating System - Fuel Type: (Check box for all that apply)	1
Natural Gas Electric	Coal Fuel Oil
Wood Other (specify):	
Heating - Conveyance System: (Check box for all that apply)	
Forced Hot Air Electric Baseboard	Wood Stove Fireplace
Forced Hot Water Hot Water Radiation	Heat Pump Kerosene Heater
Other (specify):	1992
Type of Ventilation System: (Check box for all that apply)	
Central air handler / blower Mechanical / celling fans	Bathroom ventilation fans Air-to-air heat exchanger
Kitchen range hood fan Other (specify):	10 to
Does the Residence have Air Conditioning: (Check box for all that apply)	
Central Air Conditioning Window Air Conditioners	Other (specify):
Describe the current operating conditions of the HVAC system:	
Miscellaneous Information	THE PROPERTY WITH PERSON AND PROPERTY OF THE PERSON OF THE
Does the Residence have any of the following?	W-,
	ation / Private Well?
Existing subsurface depressurfzation (radon) system in place? Yes / No	ts it running? Yes / No / VA
Is there standing water outside the residence (pond, ditch, swale)? Yes / G Has the residence been retrofitted / weatherized with any of the following? (Check bo	
Al al Day C Mary	, is a car usually parked in the garage? Yes / No
Have any pesticides / herbicides been applied around the building foundation or in the	e yard / gardens? Yes / No
If so, when - and which chemicals?	
	When / by whom?
Do the occupants of the building have their clothes dry-cleaned? Yes /	(No)
When were dry-cleaned clothes last brought into the building?	
Have the occupants ever noticed any unusual odors in the building? Yes /	€b_
Describe (with location):	

Bûilding Survey	Page 3 of 4
Building Address:	Date: 2 15 17
Minesting and Information Continued.	
Miscellaneous Information Continued: Have there been any known spills of a chemical immediately outside or inside the building? Yes	
Describe (with location):	/ No /
Do any of the occupants smoke inside the building? Yes / No How often?	- W-1811 - W
Do any of the occupants use solvents at work? Yes / No Are their clothes was	hed at home? Yes / No
If so, when - and what rooms?	1.4
Within the last 6 months, has there been any painting or remodeling in the residence?	If so, when
What rooms, and what specifically was done?	
Within the last 6 months, has any new carpeting been installed? Yes / No Have the carp If so, when, what rooms, and what cleaners?	ets or rugs been cleaned? Yes / No
Consumer Products Inventory	
Check consumer products that are present in the residence.	
Paint or Wood Finishes (Spray or can) Storage Location Frequency Rosc T Cav Prox 1	Of Usage Date of Last Use
Paint stripper / remover / thinner	000
Solvent cleaners (e.g., spray-on oven cleaner)	
Metal degreaser / cleaner	
Gasoline / diesel fuel	
Glues or adhesives (super glue, etc.)	
Air fresheners & scented candles	7904
Laundry / carpet spot removers Northol Laundry 5 127/4 >	
Nail polish remover (acetone)	
Aerosols (deodorizers, polish, cleaners)	
Other:	
Other:	
Other:	
Describe any products that are containerized during sampling event:	
Non	
Provide any additional information that is provided by interviewee:	

Building Address: Property			Date: 2/15/1	52.4 · 3	
	nce to house) I, including fireplace	54), 4	f garage and main rooms S2-09 S1-09	0.390	31
10 534 0	S 73 200	\$m	(0.427	Resul	27A
Ding Acc 0.157	Kitchen	Bathroon	Redon	d ay	thesis of enchease toumpl
0,945 (0,1 470 Roa 174-08	00	9,9 73 ec	2000 900		
Post Sampling Review Date Noted: 3/23/27 Has any information changed during the s Did windows and doors remain closed?	ampling event?	Sampling Team:	r n		
Was any dry cleaning brought home? Were any of the consumer products discu	ssed yesterday used in the la	est 24-hours? <u>ħ</u> ð			

June 2017

Building Sung Uptate Date: 4 17 the extrar Changes to Building + Some Raylute - No glug in our freshmers the Resident had added to quantity of household cleaning products stand in the brent. Due to it of containers - material products could not be renovel.

7.2 readings ground products. - No other additional Chemicals PID Rentys 1.18 Pm Boset Den 1.163 27m Bosent Bothroom 1.17 22m Basent Belson 1.163 Pom Basent Laurdy Roon 1.194 22m 1st fl, Kitchen 1,245 PZm 1,213 22m 1st fl. Live Roon 1.219 55~ 1st A Bedream west end.

Prepared by:

Brilling Survey Vastate
6/7/17 Pazerty 4

Prepared by

No Exterior Changes to brilly

Some Residuts

No New chancels in house

No That is air freshours

PID Readings

S6372b NE army S5-09 Basement

S6072b Den Breent

S5072b Loundy Roon Bosent

547 725 Stornge Roon SW corm Basemt

657 72b Dinny Room 1st Floor

665 72b Lung Roon 1st Floor

14

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28

Bulling Survey Uzdate
6/10/17

Prepared by:

Date: 6/16/17

Property 6 (Residential Property)

No Exterior Changes to build Sance residents

Both Residents Smoke in-side building

No AC- Windows open dury Samply

No new chanicals in the house

Pto Realys

80pp extend of bosesut (55-05)

75 pp rest end of bosesut (55-04)

590-720 pp west end of Po first floor

530 pp Katchen

600 pp Lest and of lay Room

5200 pp East and of lay Room

Attachment 6
Subslab Soil Gas, and Indoor,
Crawlspace, and Outdoor Air Sampling
Forms

August 2016

ch2m:

Vapor Intrusion Best Practices Subslab Soil Gas Probe Installation and Sampling Log - Canister Method

	Project Info Project Sampler	t Name: SE	Rock ford				81661/ET-01
	Structure						
	Identificati Address: Slab Infor	mation: Condition of slab	Sold (gravel, sand, etc. etc.)		Property	6 (Residential Pr	operty)
	Subslab S	oil Gas Probe in	stallation, Probe Purg	ing, L	ak Checkin	g, & Sampling Log	
Sample location (show in diagram)	describe and	Boscot St.	ing-witsid	Fi	eld Analysis	O2 (%)	16.2
Probe and Sample dentification (field		SER-SS-		М	ultiRAE PID	CO (ppm)	0
Probe	Date and time	-11	820			H2S (ppm)	0
istaliation	Thickness of	slab (inches)	"			LEL (%)	8
)	Depth of hole slab surface)	drilled (inches below	01-01194"			Total VOCs (ppm)	0.1
		neasure in hole with	~55611:0-1.		anister ampling	Canister ID	A500374
	Depth of insta	alled probe (inches	34			Flow controller ID	FRCRO612
Manifold Leak Check	Leak check (s Pass/No Pas	sampling manifold) - s	Pass	1		Pressure gauge ID (optional)	NA
Probe Purge	Purge rate (n	nL/min)	200mllmin	1		Sampling rate or period (mL/min or hours)	24 hr 29hr 7
-	Purge start ti	me	1154			Sample start date and time	1250 8/1/1
	Purge vacuu	m (" Hg)	0	1		Initial canister pressure (" Hg)	-29,34
	Purge comple	etion time	1200	1		Sampling vacuum (" Hg)	0
Water Dam Leak Check*	Leak check (pass or fail?)	Pass	1		Sample completion date and time	1227 8/17/16
The substab soil bubbles observed	and the water I		k check if there are no in the water dam during se probe fails the leak test.			Final canister pressure (* Hg)	-8,59
Weather condi	tions during	sampling:					
Observations a	and Comme	nts:					

	Project Info	200 200 200	History and the second			
2	Project Name: 2 E	Rockford			8 16 1	0)-0E1101
	Structure					
	Identification: SSA Address: Slab Information: Condition of slab	Good Good	at Basent	Property 6 (Re	esidential F	Property)
Eset ext	Describe material u	inder the slab (gravel, sand, etc.) Sand,			
1.10	Subsiab Soil Gas Probe	installation. Probe Pural	ng, Leak Checkin	a & Semplina Loa		V 30 (10 (10 (10 (10 (10 (10 (10 (10 (10 (1
Sample location show in diagram	describe and SER-SS-0	G-18180-50	Field Analysis	02 (%)	181	<u> </u>
Probe and Sampl dentification (fie	1d 1D) 5:5-5 From	Acl Desy)	MultiRAE PID	CO (ppm)	0	
Probe nstallation	Date and time 8914	1340		H2S (ppm)	0	
	Thickness of slab (Inches)	5"		LEL (%)	8	
	Depth of hole drilled (inches below slab surface)	8"		Total VOCs (ppm)	0	
	Total VOCs measure in hole with PID (ppmv)	0480-0.791974	Canister Sampling		1501011	1002119 D
	Depth of installed probe (inches below slab surface)	3"		Flow controller ID	Rooils	ARROO 109
fanifold Leak Sheck	Leak check (sampling manifold) - Pass/No Pass	PASS		Pressure gauge ID (optional)	ΔΙΛ	Garachel
robe Purge	Purge rate (mL/mln)	200m/m/n		Sampling rate or period (mL/min or hours)	741	230 C
	Purge start time	1138		Sample start date and time	12.19	8/11/17
İ	Purge vacuum (* Hg)	3		Initial canister pressure	29,40	-19,45
	Purge completion time	1143		Sampling vacuum	NA	47,43
/ater Dam Leak	Leak check (pass or fall?)	Diss		(" Hg) Sample completion	F11.113	11:12 8/1
The substab soil of ubbles observed a	gas probe passes the water dam lea and the water level doesn't drop with collect a subslab soil gas sample if t	nin the water dam during		Final canister pressure (" Hg)	-6.89	-7.5)
Veather condit	ions during sampling:	NOT THE STATE OF T	**************************************			
)bservations a	nd Comments:		· · · · · · · · · · · · · · · · · · ·			



Vapor Intrusion Best Practices

Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method

Property 6 (Residential Property)

Field ID	Bldg #	Location Description	Canister ID	Pressure Gauge ID	Flow Controller ID	Flow Controller Rate	Sample Start Date	Sample Start Time	Initial Canister Pressure ("Hg)	20-hr Check Time	20-hr Check Pressure ("Hg)	Sample End Date	Sample End Time	Final Pressure ("Hg)	Indoor Temp (°F)	Outdoor weather conditions	
9C3-01-	NA	Cont soil East End Bosent	716 716	NA_	90000	242	\$(4)H	1218	₹38;91	1125	-97	8/17/14	1135	۶, _{8°}	302	Sinny 270s	Flow Controller Leak Checkpo
CS-01 0816-D TA-03-	ムワ	Ovz -	4co1-	MA	FUX 20069	247	8/14/8	BIR	~39.4 ₇	1158	_ •	8/17/1	1125	12.55	703	Sunny 703	
08/7	20	KASher	AC02	M	FCR 00167	24h	8/11/R	1225	-29,30	log	40.11	8)17/4	1108	70.11	70s	Sunny 70s	Egualized-Can Valve moves-possish leak
IA-04-	ND	Livy Room on speakers	1501139	NA	BRC00 134	246	8/18/18	1533	J39178	1108	-13	8/17/14	12/5	8,03	200	11	
IA-04- 0816-D	No	Blim Room Speckers	A501132	1 kal	20152 20152	242	811416		·29,14	1108		11/4			703	1)	
9180-10-40	NO	Ust side on Poz.	683	NA	193	244	8/16/16	245	,78' 24	1	l	8/17/14	Î150	-5.94	703	Sman 705	·
0A-01-0876	ND	11	26 4000	NA	PCR00	24/	21.1	1245	-27,42	1/50	7	1/1/1/8	1150	6.78	705	Sunny 70 s	×
												,					ė
field duplicate					,												

Builly has no AC Open Windows, Smoker

Boll

	Project Inf Project Sampler	t Name: SE	Rockford		Project # :	678601-ET.07
	Structure			Market Market		
	Identificati Address:	ion:		\$<0-	- \ Property 5 (Co	ommercial Property)
	Slab Infor	mation:	- 			
			er the slab (gravel, sand, etc.	sard .		
	Subslab S	ioil Gas Probe Ins	tallation, Probe Purgi	Ing, Leak Checkin	g, & Sampling Log	
Sample location show in diagram	•	SS-01 Bo	somet otheric	Field Analysis	O2 (%)	19.9
Probe and Samp dentification (fie		SER-55-01-	1 0 11	MultiRAE PID	CO (ppm)	33
Probe nstallation	Date and time		3 8 H 1501	6	H2S (ppm)	0.0
	Thickness of	slab (inches)	4"		LEL (%) Not	6
	Depth of hole slab surface)	drilled (inches below	7"		Total VOCs (ppm)	0.0
	Total VOCs n PID (ppmv)	neasure in hole with	0,000	Canister Sampling	Canister ID	AS00996
	Depth of Insta	alled probe (inches urface)	3"		Flow controller ID	FCA-01029
Manifold Leak Check	Leak check (s Pass/No Pas	sampling manifold) - s	P085		Pressure gauge ID (optional)	NA
Probe Purge	Purge rate (n	nL/min)	0,2ml/m		Sampling rate or period (mL/min or hours)	The The
	Purge start til	me	0803		Sample start date and time	1130 2111
	Purge vacuul	m (* Hg)	0		Initial canister pressure (* Hg)	-28,72
	Purge comple	etion time	3888	000	Sampling vacuum (" Hg)	0
Water Dam Leak Check*	Leak check (pass or fall?)	2055		Sample completion date and time	1553 8/7/1
The subslab soil	and the water I	ses the water dam leak level doesn't drop within to soil gas sample if the			Final canister pressure (* Hg)	-5.78
Weather cond	itions during	sampling:	Sunny	MANAGEMENT PROP		
Observations	and Comme	nts:			*****	

	Project In	····			Salawa Maan waa	
	Projec Sampler	t Name: SE (sockhoud			:678 601 ET. 07 : 8/17/16
Having	Structure					
	ldentificat Address:	ion: SER	- 82-07-08	L	Property 5 (Co	mmercial Property)
	Slab Infor	Condition of slab	Covical with		NUTHENN	
		Is water present in th	e soll? No			
		oil Gas Probe in	stallation, Probe Purg	ing, Leak Checkin	g, & Sampling Log	
Sample location show in diagram		Truck BA	2	Field Analysis	O2 (%)	16.0
Probe and Samp dentification (fie		SER-55-	35-28	MultiRAE PID	CO (ppm)	6
Probe nstallation	Date and time		15AO 8/1/2		H2S (ppm)	0.0
	Thickness of	slab (Inches)	5"		LEL (%)	7
	Depth of hole slab surface)	drilled (inches below	8"		Total VOCs (ppm)	0.0
	Total VOCs m PID (ppmv)	neasure in hole with	10,6-11,7 gzm	Canister Sampling	Canister ID	500 180
	Depth of insta below slab su	illed probe (inches rface)	3"		Flow controller ID	FCA-06057
lanifold Leak Check	Leak check (s Pass/No Pass	ampling manifold) -	2955		Pressure gauge ID (optional)	NA
Probe Purge	Purge rate (m	L/min)	O.a/ml/min		Sampling rate or period (mL/mln or hours)	8 m 3h. 3
	Purge start tin	ne	7580		Sample start date and time	817/16 0832
	Purge vacuun	n (* Hg)	0		Initial canister pressure (** Hg)	-29,35
	Purge comple	tion time	0829		Sampling vacuum (" Hg)	0
Vater Dam Leak iheck*	rear clieck (b	•	2055		Sample completion date and time	1554 8 15/16
ubbles observed	and the water le	es the water dam leak evel doesn't drop within b soil gas sample if the	check if there are no n the water dam during e probe fails the leak test.		Final canister pressure (" Hg)	-9.19
Veather condi	tions during s	sampling:	Sung 705	_G mWin.	λ	
Observations a	ind Commen	ts:				
-						

Annifold Leak Probe Purge Purge rate (mL/mln) Purge start time Purge vacuum ("Hg) Purge completion time Vater Dam Leak Leak check (pass or fail?) Vater		Projec Sampler		Brokery			:678 601-E7-0)
Address: Slab Information: Condition of slab Describe material under the slab (gravet, sand, etc.) Subslab Soil Gas Probe Installation, Probe Purging, Leak Checking, & Sampling Log Sample location (describe and how in diagram) And diagram And di		Structure				ndia sepanjana je	
Subslab Soil Gas Probe Installation, Probe Purging, Leak Checking, & Sampling Log Sample location (describe and show in diagram) Probe and Sample dentification (field ID) Probe nstallation Date and time 15HL 13 1888 MultiRAE PID CO (ppm) Depth of hole drilled (inches)	• *	Address: Slab Inform	mation: Condition of slab Describe material und	Covered with	~ sollbirt		ommercial Property)
Sample location (describe and show in diagram) Probe and Sample dentification (field ID) SEC-SC-OSOBIL Thickness of slab (inches) Depth of hole drilled (inches below slab surface) Total VOCs measure in hole with PID (ppmv) Depth of installed probe (inches below slab surface) Annifold Leak Deak check (sampling manifold) Pass/No Pass Probe Purge Purge start time Purge start time Purge completion time Purge completion time Purge completion time Valer Dam Leak Leak check (pass or fail?) Valer Dam Leak Usele Completion the water dam leak check if there are no ubbles observed and the water level doesn't drop within the water dam during	210			_\			
Probe Purge Purge rate (mL/min) Purge start time Purge vacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge sacuum ("Hg) Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge sacuum ("Hg) Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge sacuum ("Hg) Purge completion time Purge completion time Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge completion time Purge completion time Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge completion time Purge completion time Purge sacuum ("Hg) Purge completion time Purge completion time Purge sacuum ("Hg) Purge completion time Purge sacuum ("Hg) Purge completion time Purge vacuum ("Hg) Purge vacuum ("Hg		describe and	Mai trace	Stallation, Probe Pur			195
Thickness of slab (linches) Depth of hole drilled (inches below slab surface) Total VOCs measure in hole with PID (ppmv) Depth of installed probe (inches below slab surface) Manifold Leak Check (sampling manifold) Pressure gauge ID (optional) Purge rate (mL/min) Purge start time Purge vacuum ("Hg) Purge completion time Nater Dam Leak Check (pass or fall?)			SER-55-0	30816	MultiRAE PID	CO (ppm)	0
Depth of hole drilled (inches below slab surface) Total VOCs measure in hole with PID (ppmv) Depth of installed probe (inches below slab surface) Asnifold Leak Check Check Probe Purge Purge rate (mL/mln) Purge start time Purge vacuum (* Hg) Purge completion time Vater Dam Leak Check (pass or fail?) Vater Dam Leak Check (pass		Date and time	1545	13 SM 8)	3/16	H2S (ppm)	0.0
Stab surface) Total VOCs measure in hole with PID (ppmv) Depth of installed probe (inches below stab surface) Leak check (sampling manifold) - Pass/No Pass Probe Purge Purge rate (mL/min) Purge start time Purge vacuum ("Hg) Purge completion time Vater Dam Leak check (pass or fall?) Final canister pressure (ppm) Canister Sampling Flow controller ID Pressure gauge ID (optional) NA Sampling rate or period (mL/min or hours) Sample start date and time initial canister pressure ("Hg) Sampling vacuum ("Hg) Sampling vacuum ("Hg) Sample completion date and time Final canister pressure Final canister pressure)	Thickness of s	slab (Inches)	4"]	LEL (%) (/	4
PID (ppmv) Depth of installed probe (inches below stab surface) Annifold Leak Check Pass/No Pass Purge rate (mL/mln) Purge start time Purge vacuum (* Hg) Purge completion time Vater Dam Leak Check Pasubslab soil gas probe passes the water dam leak check if there are no unbbles observed and the water level doesn't drop within the water dam during PID (ppmv) As 0 390 Flow controller ID Flow controller ID Pressure gauge ID (optional) Sampling rate or period (mL/min or hours) Sample corpletion date and time Initial canister pressure (* Hg) Sample completion date and time Final canister pressure Final canister pressure Final canister pressure			drilled (inches below	2"		1	0.0
Depth of installed probe (inches below slab surface) Annifold Leak Check (sampling manifold) - Pass/No Pass Probe Purge Purge rate (mL/mln) Purge start time Purge vacuum ("Hg) Purge completion time Purge completion time Purge completion time Purge start time Leak check (pass or fall?) Passer gauge ID (optional) Sampling rate or period (mL/min or hours) Sample start date and time Initial canister pressure ("Hg) Sampling vacuum ("Hg)			easure in hole with	2.600 22		Canister ID	As 00 390
Probe Purge Purge rate (mL/mln) Purge start time Purge vacuum (* Hg) Purge completion time Purge completion time Purge subslab soil gas probe passes the water dam leak check if there are no pubbles observed and the water level doesn't drop within the water dam during (optional) Sampling rate or period (mL/min or hours) Sample start date and time Sample start date and time Sampling vacuum (* Hg) Sampling vacuum (* Hg) Sample completion date and time Final canister pressure				D		Flow controller ID	FCA-06825
Purge start time Purge vacuum ("Hg) Purge completion time Vater Dam Leak check (pass or fall?) The subslab soil gas probe passes the water dam leak check if there are no ubbles observed and the water level doesn't drop within the water dam during (mL/min or hours) Sample start date and time Initial canister pressure ("Hg) Sampling vacuum ("Hg) Sample completion date and time Final canister pressure				2855			NA
Purge vacuum (" Hg) Purge completion time Vater Dam Leak Check (pass or fall?) The subslab soil gas probe passes the water dam leak check if there are no subbles observed and the water level doesn't drop within the water dam during date and time initial canister pressure (" Hg) Sampling vacuum (" Hg) Sample completion date and time 16 26 8 h	Probe Purge	Purge rate (mi	L/min)	0,2/LPM			8hr7h 3:
Purge completion time Vater Dam Leak Leak check (pass or fail?) Poss		Purge start tim	ne .	0843]		8/17/16 095/
Vater Dam Leak Leak check (pass or fall?) The subslab soil gas probe passes the water dam leak check if there are no ubbles observed and the water level doesn't drop within the water dam during The subslab soil gas probe passes the water dam leak check if there are no ubbles observed and the water level doesn't drop within the water dam during		Purge vacuum	ı (" Hg)	٥			-29,41
The subslab soil gas probe passes the water dam leak check if there are no ubbles observed and the water level doesn't drop within the water dam during		Purge comple	tion time	0849			0
ubbles observed and the water level doesn't drop within the water dam during	heck*	- 0	- 3 12				1626 8116
urging. Do NOT collect a subslab soil gas sample if the probe fails the leak test.	ubbles observed :	and the water le	vel doesn't drop withir	the water dam during		Final canister pressure (" Hg)	-8,45
Veather conditions during sampling: Sunn 80s		tions during s	sampling:	Sunny 80s		\$100 -100 -100 -100 -100 -100 -100 -100	- O sales or the sales of the s



Vapor Intrusion Best Practices
Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method



Property 5 (Commercial Property)

Field ID	Bldg #	Location Description	Canister ID	Pressure Gauge ID	Flow Controller ID	Flow Controller Rate	Sample Start Date	Sample Start Time	Initial Canister Pressure ("Hg)	20-hr Check Time	20-hr Check Pressure ("Hg)	Sample End Date	Sample End Time	Final Pressure ("Hg)	Indoor Temp (°F)	Outdoor weather conditions
SER-0A-		ance prilam raminal	AS 00 922	/VIT	00474	0.00			~29, 3 9	1500	-11,5	8/17/16		,58Å	750	Sung 803
SER-IA-01 OBIL SER-IA-02		ottke	1500 143	/0/\	FCA01 622	2 pm	SHOUT	७ ७८७	,39.36	1500	-19	8/17/8	55/	-6,74	75°	Sunny 80s
ogly		Hall Wall Nort	AC 3 1830	NA	FCA 00691	8hr	8)17)12	0753	-50,33	1500	10	8)1711	क्ष	-7.07	750	Suny 805
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												######################################				
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															1987/19	
field duplicate					/											ij.

December 2016



	Project In:	fo				
	Project Sampler	ct Name: SE K	Rockford		Project #	678601,ET.01 : 11/28/16
	Structure					
	Identificat Address: Slab Infor	_	Fair	Prop	erty 6 (Resident	ial Property)
		Describe material und	er the slab (gravel, sand, etc	.) See Perpo	vs Report	
			stallation, Probe Purg	ing, Leak Checkin	g, & Sampling Log	
Sample location show in diagram	•	55-04 / Busi	mint West Room	Fleid Analysis (optional)	O2 (%)	205 20,5
Probe and Samp Identification (fle		SER-55-64-11	16	MultiRae PID	CO (ppm)	3
Probe Installation	Date and time	•			H2S (ppm)	0
	Thickness of	slab (inches)	Ja-E		LEL (%)	2
	Depth of hole slab surface)	drilled (inches below	C		Total VOCs (ppm)	6,0
	Total VOCs n PID (ppmv)	neasure in hole with	le II	Canister Sampling	Canister ID	ASØ1625
	Depth of insta below slab su	alled probe (inches urface)			Flow controller ID	FCR UPU32
Manifold Leak Check	Leak check (s Pass/No Pass	sampling manifold) - s	Pass	İ	Pressure gauge ID (optional)	NA
Probe Purge	Purge rate (m	nL/min)	200 mL/min		Sampling rate or period (mL/min or hours)	101/24/Ars 22'
	Purge start tir	пе	1444		Sample start date and time	11/25/16@ 1506
	Purge vacuur	n (" Hg)	0011/4	!	Initial canister pressure (" Hg)	-28.73" Ha
	Purge comple	etion time	1449		Sampling vacuum (" Hg)	NA
Water Dam Leak Check*	Leak check (p	pass or fail?)	Pass		Sample completion date and time	11 24/168 1329
bubbles observed	and the water k	ses the water dam leak evel doesn't drop within b soil gas sample if the	check if there are no		Final canister pressure (" Hg)	11/24/10@ 1329 -6.18" Hg
Weather condi	itions during	sampling:	Heavy Raine	stort, Cloure	itend	
Observations a	and Commer	nts:				



	Project Name: SE A	20ektord			Project #	67860	1, E7,01
	Structure					TI IEDITO	
	Identification: Address: Slab Information: Condition of slab	er the slab (gravet, sand, etc			perty 6 (Reside	ntial Prope	erty)
	Is water present in the				164 1		
	Subsiab Soil Gas Probe ins	tallation, Probe Purg	ing	, Leak Checking	g, & Sampling Log	"STATE OF THE PARTY OF THE PART	
Sample location show in diagram	i FOST TIGHT I	bosch		Field Analysis (optional)	O2 (%)	20,9	
robe and Samp dentification (fie	ste	5-05-1116 5-05-1116-FD		MultiRae PID	CO (ppm)	()	
robe estallation	Date and time				H2S (ppm)	0	
	Thickness of slab (inches)	126			LEL (%)	0	
	Depth of hole drilled (Inches below slab surface)	John Mary			Total VOCs (ppm)	0,0	
	Total VOCs measure in hole with PID (ppmv)	1.5		Canister Sampling	Canister ID		ks Ø1 040
	Depth of installed probe (inches below slab surface)				Flow controller ID	FLRINIII	FCR 00 188
lanifold Leak heck	Leak check (sampling manifold) - Pass/No Pass	PASS			Pressure gauge ID (optional)	NA	NA
robe Purge	Purge rate (mL/min)	ZOO ML/MIN			Sampling rate or period (mL/min or hours)	61/21/hos	66/24hrs
Toba r ango	Purge start time	14246			Sample start date and time	11/28/166	11/24/16@
	Purge vacuum (* Hg)	0.0" Ha			Initial canister pressure (" Hg)	-28,79"4	1505 -28,77"HG
	Purge completion time	1434			Sampling vacuum (" Hg)	NA	NA
Vater Dam Leak Check*	Leak check (pass or fall?)	PASS			Sample completion date and time	11 24 16@ 1330	
ubbles observed	gas probe passes the water dam leak of and the water level doesn't drop within collect a subslab soil gas sample if the	the water dam during	•		Final canister pressure (* Hg)	-6,40	-7,80
Veather cond	itions during sampling:	englan@51	TV-	Carate	nd s	ER-55-05-1116	SER-56-05
Observations:	and Comments:	_					



Vapor Intrusion Best Practices
Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method

Property 6 (Residential Property)

Field ID	Bldg #	Location Description	Canister ID	Pressure Gauge ID	Flow Controller ID	Flow Controller Rate	Sample Start Date	Sample Start Time	Canister Pressure ("Hg)	20-hr Check Time	20-hr Check Pressure ("Hg)	Sample End Date	Sample End Time	Final Pressure ("Hg)		Outdoor weather conditions
SER-CS-D1 - 1116-FD	_	Basement East End Diplicate	A50002		1 . '	64/241	I	1502	-78.87			11/29/16	1328			Rah Sun
SER-CS-01=1116		Brant EAST EUD	8161 62A		+CROOD		1 -	1502	18.78		1	11/29/16	1328	-7.61	60-85	Ran Ism
SER -IA -03-		Basement SE Corm	-08 -08		L GOODINI)	6L/24	11/84/1	1508	₹8,60	\	/,	11/29/16	1330	-7,03	6065	Roin Sun
SER-IA-03		Bosenst Dig Corner	A500726		FCR 00	61124	11/38/11	1208	58,35			11/29/16	1330	-2.45	60-65	Rain Sun
SER-IA-04 -1116		1st Floor	A500730		-238 -238	hr 6Ц34	11/28/11	1511	-38,74	1		11/29/16	1347.		70 ₅	Rain Sun
SER-01-01		outborAir	Asolax		FCR- 20214	GU/24h	- 11/28/	1533	-28,70	1		11/29/16	1325	-5.24	405	Rain/Sus
SER-0A-21 -1116-FD		Outdoor Air Dyzhodiu	ASD1058			6/1/24	11/26)	17 1238	28.60	1		11/29/16	1325			& Rain Sun
								:				-				
field duplicate											-					



1201000	Project In	fo	DECEMBER OF THE PARTY OF THE PA			
	Projec Sampler	t Name: SER	aktoral			et#: 678601 € [.3]
Zandara Mahamana	Structure	NAME OF THE OWNER OF THE OWNER OF THE OWNER OF THE OWNER OF THE OWNER OF THE OWNER OF THE OWNER OF THE OWNER O			THE REST OF THE PERSON NAMED IN COLUMN TWO	
	Identificat Address:	ion: SER	-22-01-1114	:¹ :Pro	pperty,5 (Comme	rcial Property)
	Slab Infor	Condition of slab	Good Min			
		Is water present in the	er the slab (gravel, sand, etc soil?	Dienin.		
	Subsiab S	Soil Gas Probe ins	tallation. Probe Purn	ing I eak Che	cking, & Sampling Lo	
Sample location show in diagram	(describe and		ofotia Buildy	Field Analy (optional)		162
Probe and Samp Identification (fle		SER-SS-	31-1116	MultiRae Pl	D CO (ppm)	0
Probe Installation	Date and time	9			H2S (ppm)	0.0
	Thickness of	slab (inches)	150		LEL (%)	NA
	slab surface)		Ø eg		Total VOCs (ppm)	0.1
	PID (ppmv)	neasure in hole with	TELL	Canister Sampling	Canister ID	502164
	Depth of insta below slab su	alled probe (inches irface)			Flow controller ID	FC10078
Manifold Leak Check	Leak check (s Pass/No Pass	sampling manifold) - s	Pass,		Pressure gauge ID (optional)	NA .
Probe Purge	Purge rate (rr	nL/min)	200mL/min		Sampling rate or per (mL/min or hours)	tod GL/8hr
:	Purge start tir	me	0743		Sample start date and time	11/30/11 0842
	Purge vacuur	m (" Hg)	0		Initial canister pressi (" Hg)	-28.96
	Purge comple	ation time			Sampling vacuum (" Hg)	AN
Water Dam Leak Check*	Leak Crieck ()	pass or fall?)	P955		Sample completion date and time	11/2/100 1540
bubbles observed	and the water k	evel doesn't drop within b soil gas sample if the	the water dam during probe fails the leak test.		Final canister pressu	-0.96
Weather condi	tions during	sampling:	C/enr 308	ZM Mu	d light	
Observations a	and Commer	nts:				



	Project Info				
400	Project Name: Sampler Name:	Rockford		Project # : Date:	678601=ET.0) 11/30/16
We state out	Structure				
	Identification: TO Address: Slab Information:	ck Bay,	Prop	erty 5 (Commerc	cial Property)
	Condition of slab Describe material un Is water present in th	der the slab (gravel, sand, etc.	Sucrising Sucre	reviors	
	Subsiab Soil Gas Probe in	stallation, Probe Purg	ing, Leak Checking	g, & Sampling Log	
Sample location show in diagram		17	Field Analysis (optional)	O2 (%)	13,3
Probe and Samp Identification (fie		52-1116	MultiRae PID	CO (ppm)	0
Probe Installation	Date and time			H2S (ppm)	0.0
	Thickness of slab (inches)	150		LEL (%)	NA
	Depth of hole drilled (inches below slab surface)	15/		Total VOCs (ppm)	0.0
	Total VOCs measure in hole with PID (ppmv)	South	Canister Sampling	Canister ID	SC01495
	Depth of installed probe (inches below slab surface)			Flow controller ID	FCAMO34 Fale
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	Olu foss / Poss		Pressure gauge ID (optional)	PCA.00457 Pars
Probe Purge	Purge rate (mL/min)	200		Sampling rate or period (mL/min or hours)	66 18 hr
	Purge start time	0880 430		Sample start date and time	11/30/12 0840
	Purge vacuum (* Hg)	0		Initial canister pressure (" Hg)	-29.09
	Purge completion time	08 25		Sampling vacuum (" Hg)	NA
Water Dam Leak Check*	ceak crieck (pass of fails)	Poss		Sample completion date and time	11 30 16 @ 1546
bubbles observed	gas probe passes the water dam leat and the water level doesn't drop with collect a subslab soil gas sample if th	in the water dam during		Final canister pressure (" Hg)	-7.57
Weather condi	tions during sampling:	Clary 35			
Observations a	and Comments: 11/6c Martald Chicle:	iso late prople		contaller. R	eplace flow surface
Tedlorby	g hada hele so	Sopr Hor	puzeltw.	ia	



E01KGBBBB	Project Info				
	Project Name: SE Sampler Name:	Red tord			: 678 601,E7,01 : 11,B6/16
	Structure				
	Address: Slab Information: Condition of slab	Good Gravel, sand, etc.	M10 (4.5)		mercial Property)
	Is water present in the	soil? See ?	revors		
STEEDING S	Subslab Soil Gas Probe in	stallation, Probe Purg	ing, Leak Checkin	g, & Sampling Log	
Sample location show in diagram		ce Bry	Field Analysis (optional)	O2 (%)	18.5
Probe and Samp Identification (fle		-03-1116	MultiRae PID	CO (ppm)	0
Probe Installation	Date and time			H2S (ppm)	0.0
-	Thickness of slab (inches)	12.		LEL (%)	NA
	Depth of hole drilled (inches below slab surface)	2		Total VOCs (ppm)	0.1
	Total VOCs measure in hole with PID (ppmv)	cho.	Canister Sampling	Canister ID	502089
	Depth of installed probe (inches below slab surface)	12		Flow controller tD	FCA00731
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	2053		Pressure gauge ID (optional)	NA
Probe Purge	Purge rate (mL/min)	200		Sampling rate or period (mL/min or hours)	618hu
	Purge start time	0831		Sample start date and time	1/30/16 0839
	Purge vacuum (" Hg)	0		Initial canister pressure (" Hg)	-29,02
	Purge completion time	0831		Sampling vacuum (* Hg)	NA
Water Dam Leak Check*	Leak Check (pass of failr)	2053		Sample completion date and time	11/30/6 @ 1545
bubbles observed	gas probe passes the water dam leak and the water level doesn't drop within collect a subslab soil gas sample if the	the water dam during		Final canister pressure (" Hg)	-8.27
Weather condi	itions during sampling:	Chudy 35	****		
Observations :	and Comments:				
	and Comments.	- THE SHIP LINES		***************************************	



Vapor Intrusion Best Practices Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method

Property 5 (Commercial Property)

Field ID	Bldg #	Location Description	Canister ID	Pressure Gauge ID	Flow Controller ID	Flow Controller Rate	Sample Start Date	Sample Start Time	Initial Canister Pressure ("Hg)	20-hr Check Time	20-hr Check Pressure ("Hg)	Sample End Date	Sample End Time	Final Pressure ("Hg)	Indoor Temp (°F)	Outdoor weather conditions
SER-IA-01 -11 L		1st Floor Other	4500 -402	MA	FCA60 228	8hr	1/30/12			/		11 30/14	1537	-1.37	70	30° cloudy
-11 16 SER-IA -02 -1116 SEK-OA-02		Hallway North	AC OIL	NH	763	6L/8h	1/36/16	0847(-25.58	$) \setminus$		11/32/16	1537	-9.26	70°	300 closed
SEK-0A-02 -01116		Outside Air	A500 -199	NA	P FCA 03755	6/18h	1/34/14	७ ९०)	888	/	\	11/30/16	1600 -	-7,23		30° Clardy
						/										
															:	
										_						
field duplicate																

February 2017



CST READERING	Project info				
	Project Name: SP R	sektord		Project #:	678601-67.71
	Sampler Name:			Date:	12 5 55 11.2
	Structure				2/15/17
	Identification:	SS-06			
	Address: Var	73			
	Slab Information: Condition of slab	G08		4	
	Describe material unde	er the slab (gravel, sand, etc.	Gard Son	<u> </u>	
	Is water present in the	soll? No			
		A-U-dian Banka Busail	- Look Charlin	. B Compiler Los	
Sample location (Subsiab Soil Gas Probe ins	tallation, Probe Purgi			1495
show in diagram)			Field Analysis	O2 (%)	19.2
Probe and Sampli Identification (fiel		26-317	MultiRAE PID	CO (ppm)	δ
Probe Installation	Date and time 163	in lart		H2S (ppm)	0
	Thickness of slab (inches)	5# 15		LEL (%)	0 ,
ŀ	Depth of hole drilled (inches below slab surface)	7"		Total VOCs (ppm)	3.0 1:601 32
	Total VOCs measure in hole with PID (ppmv)	(205 2m	Canister Sampling	Canister ID	ACODEC
	Depth of installed probe (inches below slab surface)	AL		Flow controller ID	FRC00234
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	ويمح		Pressure gauge ID (optional)	NA
Probe Purge	Purge rate (mL/mln)	200		Sampling rate or period (mL/min or hours)	24/1 66 27
	Purge start time	145		Sample start date and time	1658 21217
	Purge vacuum (* Hg)	HESSI O		Initial canister pressure (* Hg)	-28.87
	Purge completion time	1651		Sampling vacuum (* Hg)	NA ,
Water Dam Leak Check*	Leak Creck (pass or latts)	725		Sample completion date and time	1508 2/2417
bubbles observed	gas probe passes the water dam leak and the water level doesn't drop within collect a subslab soil gas sample if the	n the water dam during		Final canister pressure (* Hg)	-5,93
Weather cond	itlons during sampling:	Sunny SU	2-01, Doil	5 mzh, 70)
Observations	and Comments:				



plect Name: pler	Grand Grand Grand Gravel, sand, etc.	Roon behi	Date	:678601-ET-01 :2414/57-2/22/17 2/15/17 :S-07
ication: ss: Parallel Condition of slab Describe material un	Good Gravel, sand, etc.	Roon behi		alish
ss: Normation: Condition of slab Describe material un	Good Gravel, sand, etc.	Roon behi	nd door S	S-07
ss: nformation: Condition of slab Describe material un	Good Gravel, sand, etc.	Roon behi	nd door S	S-07
	ne soli? NG	2) Sund JGM	~l	
and the second s	stallation, Probe Purg	ing, Leak Checkin	g, & Sampling Log	
FG-22 bne		Field Analysis	02 (%)	18.9
SER-5	7-0217	MultiRAE PID	CO (ppm)	ð
I time 160	45 2/19/17	1	H2S (ppm)	0
ss of slab (Inches)	-//		LEL (%)	0.
hole drilled (inches below ace)	1 (]	Total VOCs (ppm)	0 0,962 880
Cs measure in hole with onv)	2620 220	Canister Sampling	Canister ID	AS00623
installed probe (inches ab surface)	M		Flow controller ID	FCRODAIL
eck (sampling manifold) - Pass	ککھتے		Pressure gauge ID (optional)	NA
te (mL/min)	200		Sampling rate or period (mL/min or hours)	24mflbL ZZW.
art time	1632]	Sample start date and time	१६३६ वर्गार्गा
icuum (" Hg)	0]	Initial canister pressure (" Hg)	-28.94
impletion time	1637		Sampling vacuum (" Hg)	NV
ck (pass or fail?)	50.25]	Sample completion date and time	1507 3/23/17
ater level doesn't drop with	in the water dam during	`	Final canister pressure (" Hg)	4,29
ing sampling:	Surny, Sun	11 of 10-20	س ² م (لركس	
monte				
ra ne va su	valer level doesn't drop with subslab soll gas sample if t	start time /acuum ("Hg) completion time /637 neck (pass or fail?) a passes the water dam leak check if there are no vater level doesn't drop within the water dam during subslab soil gas sample if the probe fails the leak test. uring sampling: Suna Sull March Sull Marc	start time 637 completion time 637 neck (pass or fail?) 2055 a passes the water dam leak check if there are no vater level doesn't drop within the water dam during subslab soil gas sample if the probe falls the leak test. uring sampling: Suny Sulvid 10-20	Sample start date and time Initial canister pressure ("Hg) Sample start date and time Initial canister pressure ("Hg) Sampling vacuum ("Hg) Sample completion date and time Sample completion date and time Final canister pressure ("Hg) Sample start ("Hg) Sampling vacuum ("Hg) Sample pressure ("Hg) Sample start ("Hg) Sampling vacuum ("Hg) Sample pressure ("Hg) Sample completion date and time Final canister pressure ("Hg) Ining sampling: Sunny, Sulvind ("Hg)



A OKON CONT	Project Info							
	Project Name	: SE Rock	ford				67860)-E7-01	
	Sampler Name:					Date:	3/20 0/15/1J	
	Structure			ES_30	ursanal lugari			
		~	a slab (gravel, sand, e		20-15 S			
	D. L. L. L. D. H. O.	D. L. bratell	odlan Broko Bur	wie e	Last Charling	, & Sampling Log		,
Sample location (describe and SS-Q		auon, Probe Pur	guiy,	Field Analysis	02 (%)	19,3	
Probe and Sampli Identification (fiel	o SER	- 55-58- 0-(<-08-	9317-FD	7	MultiRAE PID	CO (ppm)	6	
Probe Installation	Date and time	1705	चोष्टी			H2S (ppm)	0	
	Thickness of slab (Inch	ies) 5	"			LEL (%)	9	
To Pi	Depth of hole drilled (in slab surface)	/	11			Total VOCs (ppm)	0/0º168550	~
	LID (bbitta)				Canister Sampling	Canister ID	ACO2014/ASOS	962
	Depth of installed prob below slab surface)	e (inches	JA_			Flow controller ID	FOR ONLY FOR	3017
Manifold Leak Check	Leak check (sampling Pass/No Pass	manifold) -	معري			Pressure gauge ID (optional)	NHA .	_
Probe Purge	Purge rate (mL/min)		500			Sampling rate or period (mL/min or hours)	24thr/GL ZZW	. Bow
	Purge start time	1	615			Sample start date and time 165	1 12/22/17	-
	Purge vacuum (* Hg)		δ			Initial canister pressure (" Hg)	28.90 28.45	-
	Purge completion time	, -	1935			Sampling vacuum (" Hg)	N/A	_
Water Dam Leak Check*	Leak clieck (pass of R	14	رکه			Sample completion date and time	1505	-
bubbles observed	gas probe passes the w and the water level doe: collect a subslab soil ga	sn't drop within the	water dam during			Final canister pressure (" Hg)	-6.35 - 690	3
Weather cond	itions during sampli	ng: <u>S</u>	iony St	1 1/1	Tipey 10-3	20 mph 7	o ⁵ ′	
Observations	and Comments:		•					

Ch2m:

Vapor Intrusion Best Practices

Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method

Property ID	Harry 3
Sampling Period (8 or 24 hour?)	24 hr
Sample Start Date	2/20/17
Sample End Date	2)23/17
Interior Temperature	200

Sample ID	Location Description	Canister ID	Flow Controller LD	Sample Start Time	Initial Canister Pressure (°Hg)	Sample End Time	Final Pressure ("Hg)
SER-IA-05-0017	of Room	AC02251	FCRODDE	1256	√8.8૦	1505	7.64
SER-IA-06-0217	1 xt F1 2501		1	1423	-28,87	1293	-8,43
SER-0A-03-0217	Brekynn on Ferce		FCR00126		28,80	1224	-6.91
SER-04-03-0217-FI	Buckynd on Perch	Aco 1938	FCR20274		-3853	1526	-6,24
			Vi				
9							
			329				



	Project In	fo						
	Projec Sampler	Name:	Rockt-d				: 678 601-ET;0) : 2/15/17	
	Structure	RASIS DA		91				
	Identificat Address: Slab Infor	mation: Condition of slab	Social (gravel, sand, et	c.)	Sond-			
		Soll Gas Probe in:	stallation, Probe Purg	ilng	, Leak Checkin	g, & Sampling Log		
Sample location show in diagram		Po-22		Г	Field Analysis	O2 (%)	19.5	
Probe and Samp Identification (fle			19-0217		MultiRAE PID	CO (ppm)	0	1
Probe Installation	Date and time		1415			H2S (ppm)	٥	1
	Thickness of	slab (inches)	5"			LEL (%)	0	
_ s	Depth of hole slab surface)	drilled (inches below	711			Total VOCs (ppm)	0.01 3888210.0	Q. s
	Total VOCs measure in hole v PID (ppmv)	neasure in hole with	9'352	1 1	Canister Sampling	Canister ID	Scoonza	
	Depth of insta below slab su	alled probe (inches urface)	NA			Flow controller ID	FCR0018	
Manifold Leak Check	Leak check (s Pass/No Pass	sampling manifold) - s	7255		i	Pressure gauge ID (optional)	NA	1
Probe Purge	Purge rate (m	nL/min)	200			Sampling rate or period (mL/min or hours)	124hr /66	Zhr
	Purge start tin	ne	1355			Sample start date and time 2/12	117 1445	. 53m
	Purge vacuun	n (* Hg)	0	1		Initial canister pressure (* Hg)	~ 29,00	1
	Purge comple	ation time	1359			Sampling vacuum (* Hg)	NA	1
Water Dam Leak Check*	Leak Gleck (p	•	2065			Sample completion date and time	1338 2/23/17	1
bubbles observed	and the water le	es the water dam leak evel doesn't drop within b soil gas sample if the				Final canister pressure (" Hg)	-7.06	
Weather condi	itions during	sampling: S	SUM WILL ENVIRON	<u>را</u>	-) 10-20	wsp 50,		
Observations a	and Commen	nts:	•					



	Project Sampler	t Name: SE R	apry				: 678601, ET.O)
	Structure	MOTOROZ PEROD		ELECTION (A)			. 11- 11
	Identificat Address: Slab Infon	mation: Condition of slab	der the slab (gravel, sand	d, etc.)	graci Kan		
	Subsiab S	ioll Gas Probe In	stallation, Probe P	urging	, Leak Checkin	g, & Sampling Log	
Sample location show in diagram	(describe and)	SS-digg			Field Analysis	O2 (%)	19,5
Probe and Samp Identification (fie	le id ID)	SER-55-10	-0217		MultiRAE PID	CO (ppm)	0
Probe Installation	Date and time		1435		}	H2S (ppm)	O
- -	Thickness of	slab (inches)	5"			LEL (%)	Ó
	Depth of hole slab surface)	drilled (inches below	つ゜			Total VOCs (ppm)	0.2/3.432 26
	Total VOCs m PID (ppmv)	neasure in hole with	1,237 _{22m}		Canister Sampling	Canister ID	500240
	Depth of installed probe (inches below slab surface)		NA		' '	Flow controller ID	FCROOOL
Manifold Leak Check	Leak check (s Pass/No Pass	sampling manifold) -	PSS			Pressure gauge ID (optional)	AA
Probe Purge	Purge rate (m	L/min)	500			Sampling rate or period (mL/min or hours)	64/JULA ZZM
	Purge start tin	ne	1415			Sample start date and time 2/	1452
	Purge vacuum	n (" Hg)	T			Initial canister pressure (" Hg)	-28.92
	Purge comple	tion time	1420			Sampling vacuum (" Hg)	AN
Vater Dam Leak Check*	Leak check (p	•	Pass			Sample completion date and time	1339 71241
ubbles observed	and the water le	es the water dam leak evel doesn't drop within b soil gas sample if the	check if there are no the water dam during probe fails the leak test			Final canister pressure (" Hg)	-5.92
Veather condi	tions during s	sampling:	<u> </u>	WI	ec-01, h	1W57 790	
	and Commen	4					



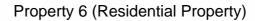
	Projec Sampler	ct Name; SE Ru	desord		Project #	
		Italile.			Date	: राजार
	Structure	. On >1				
32	Identificat Address: Slab Infor	mation: Condition of slab	Good ler the slab (gravel, sand,	etc.) <u>Sov-A</u> Gr	w.l	
	Subsiab S	Soll Gas Probe in:	stallation, Probe Pu	rging, Leak Checkin	g, & Sampling Log	
Sample location show in diagram	(describe and)	The state of the s		Field Analysis	O2 (%)	19,5
Probe and Samp dentification (fis		SER-55-11	-0217	MultiRAE PID	CO (ppm)	0
<u> </u>	Date and time		1450		H2S (ppm)	٥
	Thickness of	slab (inches)	Q"5"		LEL (%)	G
	Depth of hole slab surface)	drilled (inches below	7'		Total VOCs (ppm)	0.2 2409 2
	Total VOCs n PtD (ppmv)	neasure in hole with	0323	Canister Sampling	Canister ID	ACDIZY89
	Depth of insta below slab su	alled probe (inches irface)	MA		Flow controller ID	FCRODA94
fanifold Leak Sheck	Leak check (s Pass/No Pass	sampling manifold) - s	72955	7	Pressure gauge ID (optional)	NA
robe Purge	Purge rate (m	nL/min)	202		Sampling rate or period (mL/min or hours)	24hr/61 221
	Purge start tir	ne	14383		Sample start date and time	450 2/22/17
	Purge vacuun	n (" Hg)	Ö		Initial canister pressure (* Hg)	78.8C
	Purge comple	tion time	1439		Sampling vacuum (* Hg)	NA
Vater Dam Leak heck*	Leak check (p		2055		Sample completion date and time	1339 2/2/17
ubbles observed	and the water le	es the water dam leak eve! doesn't drop within b soll gas sample if the	check if there are no the water dam during probe falls the leak test.	<u> </u>	Final canister pressure (" Hg)	-7,36
Veather condi	tions during	sampling: S	UNNO SV W	12-20 m	y 20°	
Dh	and Commen	in				

Vapor Intrusion Best Practices Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method

Property ID	4
Sampling Pariod (8 or 24 hour?)	2445
Sample Start Date	2/22/17
Sample End Date	2/23/17
Interior Temperature	750

Sample ID	Location Description	Canister ID	Flow Controller ID	Sample Start Time	Initial Canister Pressure ("Hg)	Sample End	Final Pressure ("Hg)
SER-IA-07-0217		AS OUTOY	FGROUSE	1454	-58.85	1336	5.76
SER-IA-07-3277-FD	strainger !	A500949		1454	78.85	1336	6,52
SER-IA-08-0217	LINGROM SE GIAL	ACOLLUD	FCR DOIN	1501	-28.98		-6,86
SER-24-04-0217	Buckyard on 2001 force		fcr ooan	7516	-28.37		-6099
			23				
					,		
122	=						

June 2017





	Project Name: Sampler Name:	Porkford		Project # :	(0/0/17 (0/0/17
	Structure				A SERVICE CONTRACTOR
	Address: Slab Information: Condition of slab	of 000 der the slab (gravel, sand, etc.) a soil?Sc.e j		stall forms	
V Section	Substab Soil Gas Probe In	stallation, Probe Purgis	ng, Leak Checkin	ng, & Sampling Log	
sample location	(describe and		Field Analysis (optional)	O2 (%)	0.81
robe and Samp dentification (fie	le.	4-062017	MultiRae PID	CO (ppm)	6
robe noitsilatar	Date and time			H2S (ppm)	0
nstanation	Thickness of slab (inches)	100		LEL (%)	0
	Depth of hole drilled (Inches below slab surface)	200 Colors		Total VOCs (ppm)	0.1
	Total VOCs measure in hole with PIO (ppmv)	XV WAY	Canister Sampling	Canister ID	AC02198
	Depth of installed probe (inches below slab surface)	110		Flow controller ID	FCP 00253
lanifold Leak theck	Leak check (sampling manifold) - Pass/No Pass	PASS		Pressure gauge ID (optional)	1
robe Purge	Purge rate (mL/min)	200		Sampling rate or period (mL/min or hours)	24 HP5 22
	Purge start time	440 12°8		Sample start date and time	(19/17@121
	Purge vacuum (" Hg)	0 113		Initial cardster pressure (" Hg)	-29.33
	Purge completion time	1200 1213		Sampling vacuum (*Hg)	0
Valer Dam Leak Check*	Leak check (pass or fall?)	PASS		Sample completion date and time	6/10/17 @ 1033
ubbles observed	gas probe passes the water dam leak and the water level doesn't drop within collect a subslab soil gas sample if the	n the water dam during		Final canister pressure (" Hg)	-1044
Veather condi	itions during sampling:	-75.F.Swny	Outside		
	and Comments: Had To	re-prope du	e to loose	nut.	



Property 6 (Residential Property)

	Project Name: Sampler Name:	Rock-Ford		Project #	:678 601,ET,01 :6/9/17
New Markey	Structure		Karing Barata	SWEET BUILDING	
	Address: Slab Information: Condition of slab	S-05 Oxood derthe slab (gravel, sand, et e soil? Scel	ic.) See insta Install For		
	Subsiab Soil Gas Probe In	stallation, Probe Purg	ging, Leak Checkin	g, & Sampling Log	
	(describe and		Field Analysis (optional)	02 (%)	101.0
	ole SER-SS-(05-062017		CO (ppm)	0
robe nstallation	Date and time		1	H2S (ppm)	0
	Thickness of slab (inches)	a latin	1	LEL (%)	0
	Depth of hole drilled (inches below slab surface)	al jula	1	Total VOCs (ppm)	O.L
	Total VOCs measure in hole with PID (ppmv)	80 m	Canister Sampling	Canister ID	AS01170
	Depth of installed probe (inches below slab surface)	80		Flow controller ID	FCROVICE
fanifold Leak Sheck	Leak check (sampling manifold) - Pass/No Pass	PASS	1	Pressure gauge ID (optional)	-
robe Purge	Purge rate (mL/min)	200	1	Sampling rate or period (mL/min or hours)	24 HRS ZZW
ample location (d how in diagram) robe and Sample lentification (field robe istallation lanifold Leak heck robe Purge later Dam Leak heck* The subslab soil ga jobles observed an irging. Do NOT co	Purge start time	1140		Sample start date and time	6/9/17-@ 1215
	Purge vacuum (* Hg)	0		Initial canister pressure (" Hg)	-19.25
	Purge completion time	1144		Sampling vacuum (" Hg)	0
later Dam Leak heck*	Leak check (pass or fail?)	PASS	1	Sample completion date and time	6/10/17@ 1024
ubbles observed	gas probe passes the water dam leak and the water level doesn't drop within collect a subslab soil gas sample if the	the water dam during	' <u> </u>	Final canister pressure (* Hg)	-12.25
Veather condi	IN 214C	75 F Suny	ry outside		
Observations of	and Comments:				
	AND COMMINGING.				**************************************

Property 6 (Residential Property)

Vapor Intrusion Best Practices Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method

Property ID	
Sampling Period (8 or 24 hour?)	24 HRS
Sample Start Date	6/9/17
Sample End Date	6/16/17
Interior Temperature	U68 F

Sample ID	Location Description	Canister ID	Flow Controller ID	Sample Start Time	Initial Canister Pressure ("Hg)	Sample End Time	Final Pressure (°Hg)
SER-CS-01-802017	east wall in basenant	SSCW413	fcr ooza 7	1215	-29/21	lozs	12.00
SER-CS-01-062017-FD	Cat will in basement	1	FURWBOZ	1215	-29.23		-12-05
SER-IA-03-062017	basemont	A501038	FCR0231	1216	-79.3 P	1032	11.09
SER-JA-03-062017-FD	Extensión trotas (W)	AS 00542	FC 80083	1216	-29.2	1032	-9.24
SER-I4-04-06201	kitchen on Videre	45,00879	PCK-001270	1219	-21.27	1039	11.92
SER-0A-01-062019	backyard now do pen.	1850JA	FCROUZI6	1236	-29 27-	१०५८	-9.5Y
	· J.			·			



	Project Info					
	Project Name: SE	Rockford			678601,ET,0)	
	Structure					
	Identification: SEIZ-S: Address: Slab Information: Condition of slab	900d		Property 3		
	Describe material und	der the slab (gravel, sand, etc.	see install form	Il form		
	Subslab Soil Gas Probe In	stallation, Probe Purgi	ing, Leak Checkin	g, & Sampling Log	NA THE RESERVE	ð
Sample location show in diagram	(describe and		Field Analysis (optional)	O2 (%)	19-1	1
Probe and Samp dentification (fie	ole ald ID) SER_SS- D	6-062017	MultiRae PID	CO (ppm)	0	1
Probe nstallation	Date and time			H2S (ppm)	0	
	Thickness of slab (Inches)	1. m		LEL (%)	0	~
	Depth of hole drilled (inches below slab surface)	co la		Total VOCs (ppm)		
	Total VOCs measure in hole with PID (ppmv)	Sustalia ya	Canister Sampling	Canister ID	AC02102	
	Depth of installed probe (inches below slab surface)	801		Flow controller ID	FCR M219	1
lanifold Leak heck	Leak check (sampling manifold) - Pass/No Pass	6422		Pressure gauge ID (optional)	- 100	1
robe Purge	Purge rate (mL/min)	9,00		Sampling rate or period (mL/mln or hours)	ZA HRS ZZM	2
	Purge start time	1646		Sample start date and time	6/7/12 @ 1741	
	Purge vacuum (* Hg)	6		Initial canister pressure (* Hg)	-79.30	
	Purge completion time	1652		Sampling vacuum (" Hg)	0	
Vater Dam Leak	Leak check (pass or fail?)	PASS		Sample completion date and time	6/8/17@ 1602	
ubbles observed	gas probe passes the water dam leak and the water level doesn't drop within collect a subslab soil gas sample if the	the water dam during		Final canister pressure (" Hg)	-11.08	
Veather cond	itions during sampling:	80 f Sunny O	utside			
hservations	and Comments:					



	Project Info			A LE DESCRIPTION	
	Project Name: SE Sampler Name:	Rockfurd		Project #	: 678601, ET, 01 :: 6/7/17
Rowseller	Structure		Z LONGE LONGE PARTY	THE STATE OF	
	Address: Slab Information: Condition of slab Describe malerial ur	Gno J der the slab (gravel, sand, et	c.) see ins	Heror	
	Subsish Sail Gas Probe le	estalistica Casha Com	day Look Charles		
	(describe and	istanauon, Probe Purg	Field Analysis	g, & Sampling Log	180
show in diagram Probe and Samp	i i	7 6/2-171	(optional)	CO (ppm)	18.9
Probe Installation	Date and time	27 -06/CO +T		H2S (ppm)	0
installation	Thickness of slab (Inches)	- Lalla		LEL (%)	0
	Depth of hole drilled (inches below slab surface)	of Johns		Total VOCs (ppm)	0.1
	Total VOCs measure in hole with PID (ppmv)	2 XOLAN	Canister Sampling	Canister ID	AS00837 AC621
	Depth of Installed probe (inches below slab surface)			Flow controller tD	FCR 0007/4CR 0005
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	PASS	1	Pressure gauge ID (optional)	-
Probe Purge	Identification: Address: Slab Information: Condition of slab Describe material un Is water present in the Subslab Soil Gas Probe in Identification: Condition of slab Describe material un Is water present in the Subslab Soil Gas Probe in Identification (describe and diagram) Ind Sample Identification (describe and diagram) Ind Sample Identification:	200	1	Sampling rate or period (mL/mln or hours)	24 HRS + Zlh 2
	Purge start time	1713		Sample start date and time	67/17@1572
	Purge vacuum (" Hg)	0		Initial canister pressure (* Hg)	-29-39 - 29-29
	Purge completion time	1718		Sampling vacuum (" Hg)	O
Water Dam Leak Check*	Leak Check (pass of failt)	PASS]]	Sample completion date and time	6/8/17@ 1609
oubbles observed	and the water level doesn't drop with	in the water dam during		Final canister pressure (" Hg)	978/11.13
Neather condi	itions during sampling:	80 F. Sunny	atside		
Observations a	and Comments: SEV -	55-07-0620	017 - FD		



	Project Info				ESPERANT O MOTHER
	Project Name: SE	Raliford		Project #	: 678601- FT.01
	Sampler Name:	<u>.</u>		Date	:- 6/7/17
	Structure		CARDON OF SUBSE		
	Identification: SERSS— Address: Slab Information:	08 (M)		Prozvity	3
	Condition of slab	good			
	Describe material un	ider the slab (gravel, sand, etc		Porm	
	Is water present in th	ne soil?	102501 F	<i>∿</i> ~~	
AND DESIGNATION OF THE PARTY OF					· · · · · · · · · · · · · · · · · · ·
Sample location	Substab Soil Gas Probe In	istaliation, Probe Purg		g, & Sampling Log	
show in diagram	9)		Field Analysis (optional)	O2 (%)	[8.3]
Probe and Samp dentification (fie	old ID) SER-SS-	08-062017	MultiRae PID	CO (ppm)	0
Probe Installation	Date and time			H2S (ppm)	0
	Thickness of slab (inches)			LEL (%)	0
	Depth of hole drilled (inches below slab surface)	see lation	Canister Sampling	Total VOCs (ppm)	۵. ا
	Total VOCs measure in hole with PID (ppmv)	instans		Canister tD	ACOIGIG
	Depth of installed probe (inches below slab surface)	700		Flow controller ID	FCR00189
fanifold Leak heck	Leak check (sampling manifold) - Pass/No Pass	PASS		Pressure gauge ID (optional)	
robe Purge	Purge rate (mL/mln)	3 の		Sampling rate or period (mL/min or hours)	24 HRS ZZIVS
İ	Purge start time	1727		Sample start date and time	6/7/17@8174
	Purge vacuum (" Hg)	0		Initial canister pressure (* Hg)	-29.30
	Purge completion time	1733		Sampling vacuum (" Hg)	0
Vater Dam Leak heck*	Leak creck (pass or lastr)	PASS		Sample completion date and time	6/8/17 @ 1605
ubbles observed	gas probe passes the water dam leal and the water level doesn't drop with collect a subslab soil gas sample if the	in the water dam during		Final canister pressure (* Hg)	-11.54
Veather condi	itions during sampling:	80 F SWAY 1	<u>out</u> side		
		\$			1 P 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Observations a	and Comments:				

Vapor Intrusion Best Practices Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method

Property ID	Property3
Sampling Period (8 or 24 hour?)	24 HRS
Sample Start Date	6/7/17
Sample End Date	6/8/17
Interior Temperature	N 65°F

Sample ID	Location Description	Canister ID	Flow Controller tD	Sample Start Time	Initial Canister Pressure ("Hg)	Sample End Time	Final Pressure (*Hg)
SER-0A-103-067017	backgard	AC99714	FCA00774	1805	-29.29	1628	-2.64
SER-IA-05-06-2017	basement	1	l	1744	-29.30	16:17	10.93
SER-OA-03-062017-FD	buckyard	'	FCA WZQ7	1805	-29.11	1628	-11:44
SER- 1A-06-062017	living room	AS00810	FCA 01062	1750	-29.29	1625	-11.15
	•			·			



	Project Info			ME ISE STATUTE	
	Project Name: Sampler Name:	Rock Fora		Project #	:678601 ET.0) :: 60(7/17
iasiszon piit	Structure				
	Address: Slab Information: Condition of slab	S-09 Pro	c) <u>sec in</u>	stall forms	
	Subsiab Soil Gas Probe in	stallation, Probe Purg	ing, Leak Checkin	g, & Sampling Log	
Sample location show in diagram	. 12/2	-1162017	Field Analysis (optional)	O2 (%)	17.6
Probe and Samp Identification (fie	le :		MultiRae PID	CO (ppm)	0
Probe Installation	Date and time	7:0	†	H2S (ppm)	٥
	Thickness of slab (inches)	2 mstallation		LEL (%)	0
	Depth of hole drilled (inches below slab surface)	. 2 10	1	Total VOCs (ppm)	0.1
	Total VOCs measure in hole with PID (ppmv)	8 (0) 40	Canister Sampling	Canister ID	ASØ1029
	Depth of installed probe (inches below slab surface)			Flow controller ID	FCR 60230
Manifold Leak Check	Leak check (sampling manifold) - Pass/No Pass	PAS)		Pressure gauge ID (optional)	
Probe Purge	Purge rate (mL/min)	200]	Sampling rate or period (mL/min or hours)	-74 HRS 22N
	Purge start time	1355		Sample start date and time	6/7/17@ 1448
	Purge vacuum (* Hg)	0		Initial canister pressure (* Hg)	-29.27
	Purge completion time	1402		Sampling vacuum (" Hg)	0
Water Dam Leak Check*	Eeak creck (pass of failt)	PASI		Sample completion date and time	618/17 C1315
bubbles observed:	gas probe passes the water dam leak and the water level doesn't drop within collect a subslab soll gas sample if the	n the water dam during	·	Final canister pressure (" Hg)	(10) /11-0
Weather condit	tions during sampling:	Sunay 75			analog/digital
Observations a	and Comments: and -	piay-deh t	am previous	Supling	



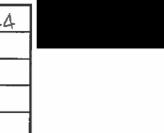
	Project Name: Project Name:	oerty 4 SE	Rockford	Project # Date	: 6/7/17 : 6/7/17
agy Maritan	Structure				
	Identification: SS Address: Slab Information:	-10	pmotya		
	Condition of slab	der the slab (gravel, sand, etc	1 1	tall krns	
	Subsiab Soil Gas Probe in	stallation, Probe Purg	ing, Leak Checkin	g, & Sampling Log	
iample location how in diagram			Field Analysis (optional)	02 (%)	18-1
robe and Samp ientification (fig	le 10) SER-SS-	10-062017 C	MultiRae PID	CO (ppm)	D
robe Istaliation	Date and time			H2S (ppm)	0
	Thickness of slab (inches)		Canister Sampling	LEL (%)	0
	Depth of hole drilled (inches below slab surface)	sel latin		Total VOCs (ppm)	0
	Total VOCs measure in hole with PID (ppmv)	institute .		Canister ID	ASULOID
	Depth of installed probe (inches below slab surface)	(Man)		Flow controller ID	FCR 00 293
anifold Leak neck	Leak check (sampling manifold) - Pass/No Pass	PASS		Pressure gauge ID (optional)	
obe Purge	Purge rate (mL/min)	200		Sampling rate or period (mL/min or hours)	24-HRS 221
	Purge start time	1436		Sample start date and time	6171701448
	Purge vacuum (" Hg)	0		Initial canister pressure (* Hg)	-29.31
	Purge completion time	1441		Sampling vacuum (" Hg)	O
ater Dam Leak heck*	Leak check (pass or fail?)	PASS		Sample completion date and time	6/8/17@ 1305
ibbles observed	gas probe passes the water dam leaf and the water level doesn't drop with collect a subslab soil gas sample if th	n the water dam during		Final canister pressure (* Hg)	(-2) / -3.01
/eather cond ∿(o2 in	tions during sampling: らんと	Sunny 75 F	outside		analog/digital
)bservations	and Comments:				***************************************



	Project Name: SE ROCKFIND Sampler Name:				: 678601 ET.0)	
	Sampler Name:			Date	: 60/7/17	
	Structure					
	Identification: Address: Slab Information: Condition of slab Describe material und	god er the slab (gravel, sand, etc	Property 4 .) See 1751	Ut form		
	To water present in the	30011 300 17	BIRIT TO I	300000000000000000000000000000000000000		_]
	Substab Soil Gas Probe In:	stallation, Probe Purg	ing, Leak Checkin	g, & Sampling Log		
ample location (how in diagram)	(describe and \$2-55 - 11 - 0	67017	Field Analysis (optional)	O2 (%)	17.5	1
robe and Sampl dentification (fie	le \ \	mest	MultiRae PtD	CO (ppm)	()	1
Probe Installation	Date and time	1 500		H2S (ppm)	0	
	Thickness of slab (inches)	Mon	Canister Sampling	LEL (%)	0	
	Depth of hole drilled (inches below slab surface)	The Market of the State of the		Total VOCs (ppm)	01	
	Total VOCs measure in hole with PID (ppmv)	The X		Canister ID	ACPLISS	
	Depth of installed probe (inches below slab surface)	/		Flow controller ID	FCR OULS	1
lanifold Leak heck	Leak check (sampling manifold) - Pass/No Pass	DASS		Pressura gauge ID (optional)	_	1
robe Purge	Purge rate (mL/min)	200		Sampling rate or period (mL/min or hours)	24 HRS 22W	- ZI,
Ī	Purge start time	1418		Sample start date and time	6/2/12@1448	1
	Purge vacuum (* Hg)	D		Initial canister pressure	-24.25	1
	Purge completion time	1423	2	Sampling vacuum (* Hg)	0	
/ater Dam Leak heck*	Leak check (pass or fall?)	PASS		Sample completion date and time	6/8/17@1309	1
ubbles observed	gas probe passes the water dam leak and the water level doesn't drop within	the water dam during		Final canister pressure	-(8) /-10.95	
	collect a substab soil gas sample if the tions during sampling:	Sunny 77 F	ort side	(19)	anuly / digital	J
				1901118-104-1		
observations a	and Comments:	THE USE WITH SHIPLE LIVE AND A SHIPLE AND A				

Vapor Intrusion Best Practices Indoor, Outdoor, Crawlspace Air Sampling Log - Canister Method

Property ID	property #4
Sampling Period (8 or 24 hour?)	24 HB
Sample Start Date	6/4/17
Sample End Date	6/8/17-
Interior Temperature	NUSOF



	Sample ID	Location Description	Canister ID	Flow Controller ID	Sample Start Time	Initial Canister Pressure ("Hg)	Sample End Time	Final Pressure ("Hg)	
5	JER- JA-07-067017	basement 515 mitel	A 3013 30	FCA00952	-bz 1451	-2926	1320	-9.08	ľ
	SER-IA-07-062017-DB	busument	AS 00575	FC R 00294	1451	-29.30	1320	-11.05	
Ľ	SER-IA-08-062017	living now in fact of Baylow	AS 60784	FCROOOG	1455	-29.15	1330	-10.58	
Ŀ	SER-0A-04-062017	backyard-swimming pool	AS01164	FCA 01093	1505	-29.70	1338	0411-	
L	200			1000					
L									
L		800 880							
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Attachment 7
Waste Characterization Results and
Disposal Documentation

Attachment 7 - Table 1. Solid Investigation Derived Waste Sampling Results - August 2016

Southeast Rockford Groundwater Contamination Superfund Site - Rockford, IL

Compound	Units	SER-IDW-01-0816 8/19/2016
TCLP Volatile Organic Compounds		3, 13, 2010
Benzene .	ug/L	20 U
2-Butanone	ug/L	100 U
Carbon tetrachloride	ug/L	20 U
Chlorobenzene	ug/L	20 U
Chloroform	ug/L	20 U
1,2-Dichloroethane	ug/L	20 U
1,1-Dichloroethene	ug/L	20 U
Tetrachloroethene	ug/L	20 U
Trichloroethylene	ug/L	20 U
Vinyl Chloride	ug/L	20 U
TCLP Semivolatile Organic Compounds		•
1,4-Dichlorobenzene	ug/L	100 U
2,4-Dinitrotoluene	ug/L	100 U
Hexachlorobenzene	ug/L	100 U
Hexachlorobutadiene	ug/L	100 U
Hexachloroethane	ug/L	100 U
3-Methylphenol	ug/L	100 U
Nitrobenzene	ug/L	100 U
Pentachlorophenol	ug/L	100 U
Pyridine	ug/L	200 U
2,4,5-Trichlorophenol	ug/L	100 U
2,4,6-Trichlorophenol	ug/L	100 U
TCLP Pesticides		•
gamma-BHC (Lindane)	ug/L	0.05 U
Chlordane	ug/L	2.5 U
Endrin	ug/L	0.1 U
Heptachlor	ug/L	0.05 U
Heptachlor Epoxide	ug/L	0.05 U
Methoxychlor	ug/L	0.2 U
Chlorinated Camphene	ug/L	10 U
TCLP Herbicides		•
2,4-Dichlorophenoxyacetic acid	ug/L	5 U
Silvex (2,4,5-TP)	ug/L	5 U
Polychlorinated Biphenyls		•
Aroclor 1016	ug/kg	93 U
Aroclor 1221	ug/kg	93 U
Aroclor 1232	ug/kg	93 U
Aroclor 1242	ug/kg	93 U
Aroclor 1248	ug/kg	93 U
Aroclor 1254	ug/kg	93 U
Aroclor 1260	ug/kg	93 U
Total PCBs	ug/kg	93 U

Attachment 7 - Table 1. Solid Investigation Derived Waste Sampling Results - August 2016

Southeast Rockford Groundwater Contamination Superfund Site - Rockford, IL

Compound	Units	SER-IDW-01-0816 8/19/2016
TCLP Metals		
Arsenic	mg/L	0.05 U
Barium	mg/L	0.71
Cadmium	mg/L	0.00052 J
Chromium	mg/L	0.05 U
Lead	mg/L	0.05 U
Selenium	mg/L	0.05 U
Silver	mg/L	0.05 U
Mercury	mg/L	0.002 U
Wet Chemistry		•
Flash Point	deg f	>200
Moisture, percent	Percent	10
рН	pH UNITS	8.2

ug/L= micrograms per liter

ug/kg = micrograms per kilogram

mg/L = milligrams per liter

deg f = degrees fahrenheit

pH units = standard pH units

TCLP = toxicity characteristic leaching procedure

J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.

U = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

Detected results are bolded

Attachment 7 - Table 2. Aqueous Investigation Derived Waste Sampling Results - August 2016

Southeast Rockford Groundwater Contamination Superfund Site - Rockford, IL

Southeast Nockjoid Groundwater Containing	tion superjuna site mockje	1
Compound	Units	SER-IDW-02-0816
-		8/19/2016
Volatile Organic Compounds		1
Benzene	ug/l	20 U
2-Butanone	ug/l	100 U
Carbon tetrachloride	ug/l	20 U
Chlorobenzene	ug/l	20 U
Chloroform	ug/l	20 U
1,2-Dichloroethane	ug/l	20 U
1,1-Dichloroethene	ug/l	20 U
Tetrachloroethene	ug/l	20 U
Trichloroethylene	ug/l	20 U
Vinyl Chloride	ug/l	20 U
Semivolatile Organic Compounds		
1,4-Dichlorobenzene	ug/l	20 U
2,4-Dinitrotoluene	ug/l	5.4 U
Hexachlorobenzene	ug/l	5.4 U
Hexachlorobutadiene	ug/l	5.4 U
Hexachloroethane	ug/l	5.4 U
2-Methylphenol	ug/l	5.4 U
3- & 4-Methylphenol	ug/l	5.4 U
Nitrobenzene	ug/l	5.4 U
Pentachlorophenol	ug/l	5.4 U
Pyridine	ug/l	11 U
2,4,5-Trichlorophenol	ug/l	5.4 U
2,4,6-Trichlorophenol	ug/l	5.4 U
Pesticides	-	· ·
gamma-BHC (Lindane)	ug/l	0.05 U
Chlordane	ug/l	2.5 U
Alpha-Chlordane	ug/l	0.1 U
trans-Chlordane	ug/l	0.1 U
Endrin	ug/l	0.1 U
Heptachlor	ug/l	0.05 U
Heptachlor Epoxide	ug/l	0.05 U
Methoxychlor	ug/l	0.2 U
Chlorinated Camphene	ug/l	10 U
Herbicides	· 0/	
2,4-Dichlorophenoxyacetic acid	ug/l	2 U
Silvex (2,4,5-TP)	ug/l	2 U
RCRA Metals	- 5/	-
Arsenic	mg/l	0.027
Barium	mg/l	0.65
Cadmium	mg/l	0.0069
Chromium	mg/l	0.32
Lead	mg/l	0.046
Selenium	mg/l	0.0082
Silver	mg/l	0.00033 J
Mercury	mg/l	0.001 U
Wet Chemistry	'''6/ '	0.001 0
Flash Point	deg f	>200
	•	
рН	pH UNITS	9.6
ug/l = micrograms per liter		

ug/l = micrograms per liter

mg/l = milligrams per liter

deg f = degrees fahrenheit

pH units = standard pH units

Detected results are bolded.

 $[\]label{eq:Jacobian} J = Estimated: The analyte was positively identified; the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria.$

 $[\]mbox{\bf U}=\mbox{\bf U}$ = Undetected: The analyte was analyzed for, but not detected above the reported sample quantitation limit.

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	14.	GENERATOR'S CERT	IFICATION: I certify the materia	als described above	on this mani	fest are not sub	bject to fee	deral regulations for	or reporting p	roper disposal of	Hazardous \	Waste.	Year
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	18.	Designated Facility Own	er or Operator: Certification of re-	ceipt of materials c	overed by the	e manifest exce	ept as note Signature	ed in Item 17a				Month Day	Year

Attachment 8
Data Quality Evaluation
Memorandums



Analytical Data Summary for Vapor Intrusion Sampling at the Southeast Rockford Groundwater Contamination Superfund Site, Winnebago County, Illinois

PREPARED FOR: U.S. Environmental Protection Agency (EPA)

PREPARED BY: CH2M HILL (CH2M)

DATE: August 17, 2017

This memorandum presents the data quality evaluation (DQE) of indoor air (IA), outdoor air (OA), crawl space (CS), subslab soil gas (SS) and exterior soil gas (SG) samples collected during the field investigation conducted August 8-19, 2016; November 28 through December 1, 2016; February 15-23, 2017 and June 7-10, 2017 at the Southeast Rockford Groundwater Contamination Superfund Site, Winnebago County, Illinois.

The objective of this investigation is detailed in the *Uniform Federal Policy Quality Assurance Project Plan (QAPP)*—Addendum I (CH2M 2015); *QAPP Addendum II* (CH2M 2016) and *QAPP Addendum III* (CH2M 2017). Guidance for the data quality evaluation assessment followed the *Quality Assurance Project Plan Southeast Rockford Groundwater Contamination Superfund Site, Winnebago County, Illinois* (CH2M 2014); EPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2016, 2017) and individual method requirements.

The sampling was performed by CH2M. The analyses were performed by ALS in Simi Valley, California. The samples were reported in six sample delivery groups (SDGs) listed as P1604080, P1605567, P1605590, P1700923, P1702791 and P1702846. The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability, and completeness (PARCC), as described in the *QAPP* and *QAPP* Addendum I. This technical memorandum summarizes the data issues identified during the general data quality assessment.

Analytical Data

This DQE report provides the results and validation for 14 normal SS samples, 24 normal SG samples; 15 IA samples; 9 outdoor OA samples; 3 CS samples; 4 SS field duplicates (FDs), 2 SG FDs; 4 IA FDs; 4 OA FDs and 3 CS FDs collected and analyzed for site-specific volatile organic compounds by Methods TO-15 (IA, OA, and CS samples) and TO-15 SIM (SS and SG samples). Samples were shipped by an overnight carrier to the laboratory for analysis.

Stage 2B validation (Level III) was performed on one hundred percent of the data to assess their analytical accuracy, precision, and completeness. The assessment of the data included a review of the following:

- Completeness
- Chain-of-custody documentation
- Holding times and sample receipt conditions

- Frequency of QC samples
- Initial calibration and continuing calibration precision and accuracy
- Blank contamination and, if any, its impact on the analytical results
- Laboratory control sample (LCS) accuracy
- Surrogate spike accuracy
- Internal standard accuracy and frequency
- Instrument tuning accuracy and frequency
- Laboratory and FD precision

In addition, a Stage 3 validation (Level IV) was performed on 10 percent of the data to verify identification of the analytes by reviewing the raw instrument data and to check the calculations of the sample and QC concentrations.

The QA/QC criteria implemented during validation were those listed in the site-specific QAPP and subsequent addendums. Standard data qualifiers were added as a means of classifying the data as to their conformance to QA/QC requirements. Multiple qualifiers are routinely applied to specific sample method/matrix/analyte combinations, but there is only one final qualifier. A final qualifier is applied to the data and is the most conservative of the applied validation qualifiers. The data qualifiers are defined as follows:

- [R] The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
- [U] Undetected. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- [J] Estimated. The analyte was positively identified; the concentration is an estimation due to discrepancies in meeting certain analyte-specific QC criteria or was reported between the detection limit and reporting limit.
- [UJ] The analyte was not detected; however, the result is estimated because of discrepancies in meeting certain analyte-specific QC.
- [UB] Undetected due to blank contamination. The analyte was detected in the sample and in an associated method, field, or trip blank. The analyte concentration is potentially the result of contamination.

In instances where multiple analyses were performed, the analytical run with the lowest reporting limits was used if the QC criteria were met for that analysis. If a sample was analyzed more than once due to a target parameter concentration above the calibration range, the results for all parameters were reported from the lowest dilution, except for the parameters exceeding the calibration range, which were reported from the diluted analysis. In instances where multiple analyses were performed with QC outside criteria, the analytical run with the least number of exceptions or best possible QC was chosen for reporting purposes.

The analytical results were within project control limits, except where noted in the following sections. Qualified data are listed in Table 1.

Soil Gas Samples

Holding Time and Preservation

Acceptance criteria were met.

Calibration

Initial and continuing calibration analyses were performed as required by the methods, and acceptance criteria were met.

Method Blanks

Method blanks were analyzed at the required frequency and were free of contamination.

Laboratory Control Samples

LCS/LCSDs were analyzed as required, and acceptance criteria were met with the following exception:

• Toluene was recovered greater than the upper control limit in one LCS associated with Method TO-15, indicating a possible high bias. The data were qualified as estimated detected results and flagged "J" in the associated samples.

Surrogate Standards

Surrogates were added to the samples, and acceptance criteria were met.

Internal Standards

Internal standards were added as required, and acceptance criteria were met.

Instrument Tunes

Instrument tunes were completed as required, and acceptance criteria were met.

Laboratory Duplicates

Laboratory duplicates were performed as required, and precision criteria were met.

Field Duplicates

FDs were collected and analyzed as required, and the relative percent differences (RPDs) were within established QC limits.

Indoor Air, Outdoor Air and Crawl Space

Holding Time and Preservation

Acceptance criteria were met.

Calibration

Initial and continuing calibration analyses were performed as required by the methods, and acceptance criteria were met.

Method Blanks

Method blanks were analyzed at the required frequency and were free of contamination.

Laboratory Control Samples

LCS/LCSDs were analyzed as required, and acceptance criteria were met with the following exceptions:

 Several analytes were recovered greater than the upper control limit in one LCS/LCSD associated with Method TO-15 SIM, indicating a possible high bias. Detected results were qualified as estimated and flagged "J" in the associated samples. Non-detected results were not qualified.

Surrogate Standards

Surrogates were added to the samples, and acceptance criteria were met.

Internal Standards

Internal standards were added as required, and acceptance criteria were met.

Instrument Tunes

Instrument tunes were completed as required, and acceptance criteria were met.

Laboratory Duplicates

Laboratory duplicates were performed as required, and precision criteria were met.

Field Duplicates

FDs were collected and analyzed as required, and the relative percent differences (RPDs) were within established QC limits with the following exceptions:

- The RPD for dichloromethane exceeded criteria in FD pair SER-IA-07-0217/ SER-IA-07-0217-FD for Method TO-15 SIM. The data were qualified as estimated and flagged "J" in the FD pair.
- The RPDs for multiple analytes exceeded criteria in FD pairs SER-IA-03-062017/SER-IA-03-062017-FD and SER-OA-03-062017/SER-OA-03-062017-FD. The data were qualified as estimated and flagged "J" in the respective FD pair.

Level IV Validation

Level IV validation was performed on 10% of the samples by CH2M. No additional issues were noted during the Level IV review. The reports can be found in **Attachment B**.

Overall Assessment

The goal of this assessment is to document that a sufficient number of representative samples were collected, and the resulting analytical data can be used to support the decision-making process. The following summary highlights the PARCC findings for the sampling events:

Precision of the data was verified through the review of the field and laboratory data quality
indicators that include FD and LCS/LCSD RPDs. Precision was generally acceptable except for several
analytes which were qualified as estimated in six samples due to FD RPD issues. Data users should
consider the impact to results that are qualified as estimated, because it may indicate a bias that
could affect the decision making process.

- Accuracy of the data was verified through the review of the calibration data, LCS/LCSD, surrogate, and internal standard recoveries, as well as the evaluation of the method blank data. Accuracy was generally acceptable except for a few analytes which were qualified as estimated in several samples associated with Methods TO-15 and TO-15 SIM due to LCS/LCSD issues. In addition, a few analytes were qualified as not detected due to method blank contamination in multiple samples associated with Method TO-15.
- Representativeness of the data was verified through the sample's collection, storage, and
 preservation procedures, and verification of holding-time compliance. The laboratory did not note
 discrepancies with sample collection, storage, or preservation procedures. The data were reported
 from analyses within the EPA recommended holding time.
- Comparability of the data was verified through the use of standard EPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as the data that are not rejected for project use. The data were considered valid, and the completeness goal of 90 percent was met for the analyte/method combinations.

References

CH2M HILL (CH2M). 2017. Quality Assurance Project Plan Addendum III, Southeast Rockford Groundwater Contamination Superfund Site, Winnebago County, Illinois. January.

CH2M HILL (CH2M). 2016. Quality Assurance Project Plan Addendum II, Southeast Rockford Groundwater Contamination Superfund Site, Winnebago County, Illinois. July.

CH2M HILL (CH2M). 2015. Quality Assurance Project Plan Addendum I, Southeast Rockford Groundwater Contamination Superfund Site, Winnebago County, Illinois. July.

CH2M HILL (CH2M). 2014. Quality Assurance Project Plan, Southeast Rockford Groundwater Contamination Superfund Site, Winnebago County, Illinois. January.

U.S. Environmental Protection Agency (EPA). 2014. *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. August.

Table 1. Data Qualification Summary

Location Identification	Scribe Sample Identification	Analytical Method	Analyte	Result	Unit	Validation Flag	Validation Reason
SER-SG-75-0816	16CR03-18	TO15	Toluene	1300	ug/m3	J	LCS>UCL
SER-SG-76-0816	16CR03-19	TO15	Toluene	370	ug/m3	J	LCS>UCL
SER-SG-77-0816	16CR03-20	TO15	Toluene	30	ug/m3	J	LCS>UCL
SER-SG-78-0816	16CR03-21	TO15	Toluene	160	ug/m3	J	LCS>UCL
SER-SG-80-0816	16CR03-23	TO15	Toluene	2300	ug/m3	J	LCS>UCL
SER-SG-76-0816-FD	16CR03-24	TO15	Toluene	380	ug/m3	J	LCS>UCL
SER-IA-05-0217	17CR01-32	TO15SIM	Trichloroethylene	0.22	ug/m3	J	LCS>UCL
SER-IA-05-0217	17CR01-32	TO15SIM	Xylene, o	4	ug/m3	J	LCSD>UCL
SER-IA-06-0217	17CR01-33	TO15SIM	Trichloroethylene	0.65	ug/m3	J	LCS>UCL
SER-IA-06-0217	17CR01-33	TO15SIM	Xylene, o	6.5	ug/m3	J	LCSD>UCL
SER-OA-03-0217	17CR01-34	TO15SIM	Trichloroethylene	0.029	ug/m3	J	LCS>UCL
SER-OA-03-0217	17CR01-34	TO15SIM	Xylene, o	0.17	ug/m3	J	LCSD>UCL
SER-OA-03-0217-FD	17CR01-35	TO15SIM	Trichloroethylene	0.038	ug/m3	U	LCS>UCL
SER-OA-03-0217-FD	17CR01-35	TO15SIM	Xylene, o	0.16	ug/m3	J	LCSD>UCL
SER-IA-07-0217	17CR01-39	TO15SIM	Dichloromethane	0.72	ug/m3	J	FD>RPD
SER-IA-07-0217	17CR01-39	TO15SIM	Trichloroethylene	0.017	ug/m3	J	LCS>UCL
SER-IA-07-0217	17CR01-39	TO15SIM	Xylene, o	0.6	ug/m3	J	LCSD>UCL
SER-IA-07-0217-FD	17CR01-40	TO15SIM	1,1,1-Trichloroethane	0.023	ug/m3	J	LCS>UCL
SER-IA-07-0217-FD	17CR01-40	TO15SIM	Benzene	0.77	ug/m3	J	LCS>UCL
SER-IA-07-0217-FD	17CR01-40	TO15SIM	Dichloromethane	0.51	ug/m3	J	FD>RPD
SER-IA-07-0217-FD	17CR01-40	TO15SIM	Trichloroethylene	0.018	ug/m3	J	LCS>UCL
SER-IA-08-0217	17CR01-41	TO15SIM	1,1,1-Trichloroethane	0.021	ug/m3	J	LCS>UCL
SER-IA-08-0217	17CR01-41	TO15SIM	Benzene	0.81	ug/m3	J	LCS>UCL
SER-IA-08-0217	17CR01-41	TO15SIM	Trichloroethylene	0.017	ug/m3	J	LCS>UCL
SER-OA-04-0217	17CR01-42	TO15SIM	1,1,1-Trichloroethane	0.023	ug/m3	J	LCS>UCL
SER-OA-04-0217	17CR01-42	TO15SIM	Benzene	0.49	ug/m3	J	LCS>UCL
SER-OA-03-062017	17CR01-49	TO15SIM	1,2-Dichloroethane	0.053	ug/m3	J	FD>RPD
SER-OA-03-062017	17CR01-49	TO15SIM	Benzene	0.3	ug/m3	J	FD>RPD
SER-OA-03-062017	17CR01-49	TO15SIM	Dichloromethane	0.3	ug/m3	J	FD>RPD

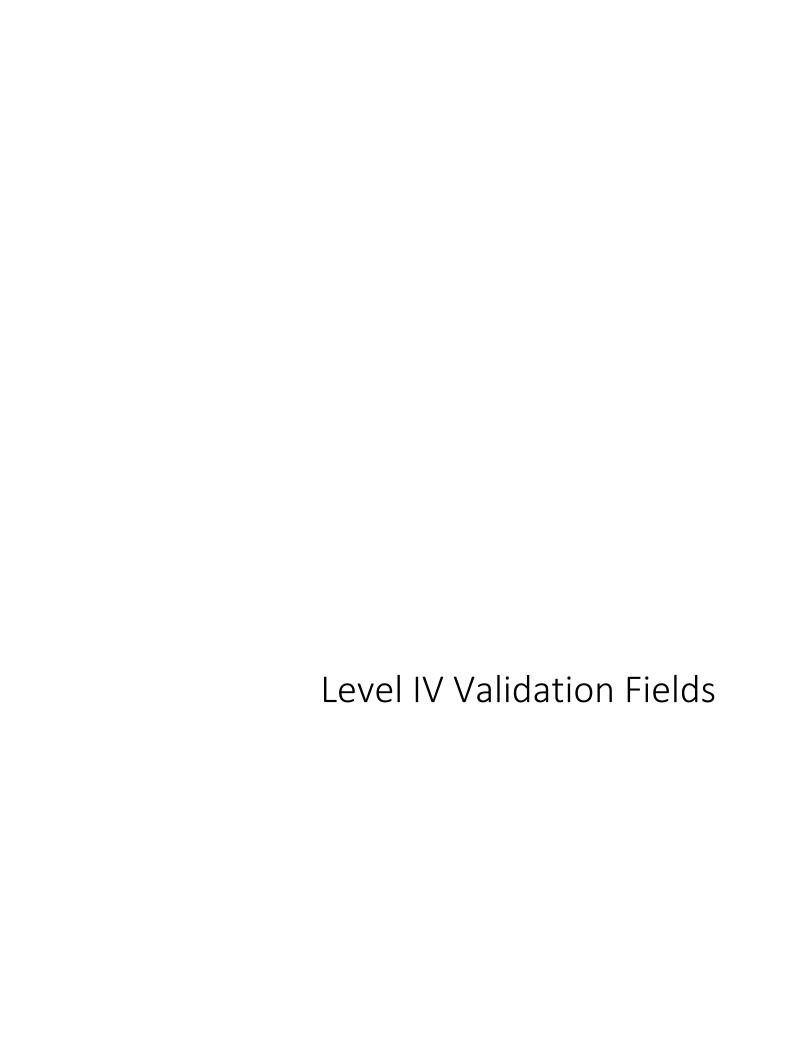
Table 1. Data Qualification Summary

LCSD>UCL

Location Identification	Scribe Sample Identification	Analytical Method	Analyte	Result	Unit	Validation Flag	Validation Reason
SER-OA-03-062017	17CR01-49	TO15SIM	Ethylbenzene	0.23	ug/m3	J	FD>RPD
SER-OA-03-062017	17CR01-49	TO15SIM	Tetrachloroethene	0.17	ug/m3	J	FD>RPD
SER-OA-03-062017	17CR01-49	TO15SIM	Toluene	1.4	ug/m3	J	FD>RPD
SER-OA-03-062017	17CR01-49	TO15SIM	Xylene, o	0.31	ug/m3	J	FD>RPD
SER-OA-03-062017	17CR01-49	TO15SIM	Xylenes, m & p	0.69	ug/m3	J	FD>RPD
SER-OA-03-062017-FD	17CR01-50	TO15SIM	1,2-Dichloroethane	0.091	ug/m3	J	FD>RPD
SER-OA-03-062017-FD	17CR01-50	TO15SIM	Benzene	0.47	ug/m3	J	FD>RPD
SER-OA-03-062017-FD	17CR01-50	TO15SIM	Dichloromethane	0.68	ug/m3	J	FD>RPD
SER-OA-03-062017-FD	17CR01-50	TO15SIM	Ethylbenzene	1.1	ug/m3	J	FD>RPD
SER-OA-03-062017-FD	17CR01-50	TO15SIM	Tetrachloroethene	0.25	ug/m3	J	FD>RPD
SER-OA-03-062017-FD	17CR01-50	TO15SIM	Toluene	5.5	ug/m3	J	FD>RPD
SER-OA-03-062017-FD	17CR01-50	TO15SIM	Xylene, o	1.7	ug/m3	J	FD>RPD
SER-OA-03-062017-FD	17CR01-50	TO15SIM	Xylenes, m & p	3.3	ug/m3	J	FD>RPD
SER-IA-03-062017	17CR01-62	TO15SIM	Benzene	1	ug/m3	J	FD>RPD
SER-IA-03-062017	17CR01-62	TO15SIM	Ethylbenzene	0.69	ug/m3	J	FD>RPD
SER-IA-03-062017	17CR01-62	TO15SIM	Tetrachloroethene	0.38	ug/m3	J	FD>RPD
SER-IA-03-062017	17CR01-62	TO15SIM	Toluene	3.4	ug/m3	J	FD>RPD
SER-IA-03-062017	17CR01-62	TO15SIM	Xylene, o	0.79	ug/m3	J	FD>RPD
SER-IA-03-062017	17CR01-62	TO15SIM	Xylenes, m & p	2.3	ug/m3	J	FD>RPD
SER-IA-03-062017-FD	17CR01-65	TO15SIM	Benzene	1.8	ug/m3	J	FD>RPD
SER-IA-03-062017-FD	17CR01-65	TO15SIM	Ethylbenzene	1.9	ug/m3	J	FD>RPD
SER-IA-03-062017-FD	17CR01-65	TO15SIM	Tetrachloroethene	0.52	ug/m3	J	FD>RPD
SER-IA-03-062017-FD	17CR01-65	TO15SIM	Toluene	8.6	ug/m3	J	FD>RPD
SER-IA-03-062017-FD	17CR01-65	TO15SIM	Xylene, o	2	ug/m3	J	FD>RPD
SER-IA-03-062017-FD	17CR01-65	TO15SIM	Xylenes, m & p	5.3	ug/m3	J	FD>RPD
Validation Reasons:							
FD>RPD	The RPD exceed	ded criteria in	the FD pair				
LCS>UCL	The laboratory	control sampl	e was recovered greater tha	an the upper	control lim	nit	

EN0930151049MKE 7

The laboratory control sample duplicate was recovered greater than the upper control limit



Initial and Continuing Calibration Worksheets - VOC-SIM

SDG Number: P1604080

lr	itial Calibratio	n Curve Calculations		
Formula for Calculation of Relati	ve Response F	actors (RRF)		
Area _X	multiplied	Amount IS	= RRF	
Area _{IS}	by	Amount _X		
where:				
Area $_X$ = Area of the characteristic Area $_{IS}$ = Area of the characteristic Amount $_{IS}$ = Amount of Internal Statement $_X$ = Amount of compound a	ion for the reference of the reference o	enced Internal Standard		
Formula for Calculation of Relati				
Standard Deviation of RRFs of _X Average RRF _X	multiplied by	100	= %RSD	
Instrument: MS19		Date : 7/7/2016	Time	
Tetrachloroethene	referenced to:	1,4-Difluoroethene		
			NR	RRF 9.9
			0.284	RRF 19.8
1703		1000	0.275	RRF 49.5
68799	Calc RRF	99 0.250	0.250	RRF 99
	Calc KKI	0.230		RRF 495
			0.267	
			0.292	RRF 990
			0.264	RRF 1980
			0.258	RRF 4950
			0.259	RRF 9900
Standard Deviation =	0.0132288		0.269	RRF 49500
Average RRF =	0.0132288	Laboratory AVG RRF =	0.269	
% RSD =	4.92	OK? Laboratory %RSD = OK?	Yes 4.92 Yes	

Initial and Continuing Calibration Worksheets - VOC-SIM

SDG Number: P1604080

Continuing Calibration Curve Calculations										
Formula for Calculation of Relative Response Factors (RRF)										
Area _X	multiplied	Amount IS	= RRF							
Area _{IS}	by	Amount _X								
where:										
Area $_{X}$ = Area of the characteristic	ion for the comp	oound to be measured								
Area IS = Area of the characteristic	ion for the refer	enced Internal Standard								
Amount _{IS} = Amount of Internal Sta										
Amount $_{X}$ = Amount of compound	added									
CCAL Filename:		Date/Time:								
08251604.D		8/25/16 0843								
-	referenced	4.4 B'()								
Tetrachloroethene	to:	1,4-Difluoroethene	_							
9953		1000	CCAL RRF=	0.272						
73836		495		0.2.2						
		Laboratory	CCAL RRF =	0.272						
Formula for Calculation of perce	ent Difference (%D)								
ICAL AVG RRF - CCAL RRF	multiplied	100	= %D							
ICAL AVG RRF	by									
NA/I										
Where: ICAL AVG RRF = The average rel	ative response fo	actor from the curve								
CCAL RRF = The Relative Respor			fication run daily	,						
•		-	-							
			%D =	-1.2						
		Laboratory %D =	1.1							
		OK?	* * *							

Comment: Difference due to rounding.

Sample Compound Concentrations - VOC-SIM

SDG Number: P1604080

Formula for Calculation of Concentrations		Air		
(Area _x) (Mass _{is}) (Df)	=	Mass in pg		
(Area _{IS}) (RRF _X)				
where:				
Area $_X$ = Area of the characteristic ion for the compound	to be mea	sured		
Area _{IS} = Area of the characteristic ion for the referenced	d Internal S	Standard		
Mass _{IS} = Mass of Internal Standard added (pg)				
$RRF_X = AveragevRRF$ of compound from initial calibrati $DF = Dilution Factor$	on curve			
(Mass in pg)	=	Concentration in ng/L	=	Concentration in ug/m3
(Injection Volume in L) (1000)				
where: 1000 is conversion from pg to ng Sample ID:		Air		
P1604080-005		Air		
1 100 1000 000		Toluene		
On-Column Mass =		3244.6		
Area _x =		220800		
Area _{IS} =		72975		
Mass _{IS}		1000		
$RRF_X =$		0.933		
Conversion Factor = DF =		1000 1.68		
Compound(s)	Lab Conc in ug/m3	Calc Concentration in ug/m3	Lab Mass in pg	Calc Mass in pg
Toluene	5.50	5.45	NR	5448
Concentrations agree within 2% ?		Yes		

Comment:

NR: Not reported

Surrogate Recoveries - VOC-SIM

SDG Number: P1604080

% Recovery	y = Concentration or amount found Concentration or amount spiked				
Sample ID : P1604080-007					
Surrogate	Amt/Conc found	Amount/Conc spiked	% Rec	Lab %REC	OK?
					V
Bromofluorobenzene	1017.4	1000	102	102	Yes
Bromofluorobenzene 1,2-Dichloroethane-d4	1017.4 904.70	1000 1000	102 90	102 91	Yes Yes

LCS/LCSD Recoveries - VOC-SIM

SDG Number: P1604080

	% Recovery	=	Concentration or amour	nt found	x 100	
		_	Concentration or amoun	t spiked	_	
	LCS Sample ID: P160825-DLCS		LCS Sample ID:			
	Compound	Conc found	Conc spiked	% Rec	Lab %REC	OK?
S #1	Vinyl Chloride	3.16	4.00	79	79	Yes
SD #1	Vinyl Chloride	3.18	4.00	80	80	Yes
S #2	cis-1,2-Dichloroethene	3.51	4.36	81	81	Yes
SD #2	cis-1,2-Dichloroethene	3.52	4.36	81	81	Yes
S #3	Benzene	4.68	4.52	104	104	Yes
SD #3	Benzene					
	201120110	3.97	4.52	88	88	Yes
	Formula for Calculation of Relative Percent Difference		LCSR - LCSDR (1/2) (LCSR + LCSDR)	x 100	88	Yes
	Formula for Calculation of Relative Percent Difference	ence =	LCSR - LCSDR		88	Yes
	Formula for Calculation of Relative Percent Difference Relative Percent Difference where: LCSR = Laboratory Control Spike Recovery LCSDR = Laboratory Control Spike Duplicate Recover Compound(s)	ence =	LCSR - LCSDR		OK?	Yes
1	Formula for Calculation of Relative Percent Difference Relative Percent Difference where: LCSR = Laboratory Control Spike Recovery LCSDR = Laboratory Control Spike Duplicate Recover Compound(s) Vinyl Chloride	ence =	LCSR - LCSDR (1/2) (LCSR + LCSDR)	_ x 100	OK? Yes	Yes
1 2 3	Formula for Calculation of Relative Percent Difference Relative Percent Difference where: LCSR = Laboratory Control Spike Recovery LCSDR = Laboratory Control Spike Duplicate Recover Compound(s)	ence =	LCSR - LCSDR (1/2) (LCSR + LCSDR)	_ x 100 tab RPD	OK?	Yes

Duplicate Precision Recoveries - VOC-SIM

SDG Number: P1604080

Formula for Calculation of Relative Percent	Difference			
Relative Percent Difference	=	MSR - MSDR (1/2) (MSR + MSDR)	x 100	
where:				
MSR = Matrix Spike Recovery MSDR = Matrix Spike Duplicate Recovery				
Sample ID : P1604080-004		Compound Trichloroethene		
Sample Sample Concentration =	116.72	Duplicate Duplicate Concentration =	117.33	
Compound(s)		RPD (Conc)	Lab RPD	OK?
Trichloroethene		0.5	NR	Yes

Initial and Continuing Calibration Worksheets - VOC

SDG Number: P1604080

	Initial Calib	ration Curve Calculations		
Formula for Calculation of Rela	tive Response I	Factors (RRF)		
Area _X	multiplied	Amount IS	= RRF	
Area _{IS}	by	Amount _X		
where:				
Area $_{X}$ = Area of the characteristic Area $_{IS}$ = Area of the characteristic Amount $_{IS}$ = Amount of Internal St Amount $_{X}$ = Amount of compound	ion for the refer andard added added	renced Internal Standard		
Formula for Calculation of Rela	tive Standard D	eviation (%RSD)		
Standard Deviation of RRFs of X	multiplied	100	= %RSD	
Average RRF _X	by			
Instrument: MS08	,	Date : 8/9/2016	Time	
1,1-Dichloroethane	referenced to:	Bromochloromethane		ng / pg
			1.728	RRF 0.08 / 83.2
		12.5 0.416 1.698	1.727	RRF 0.10 / 104
11802			1.653	RRF 0.20 / 208
208811	Calc RRF		1.698	RRF 0.40 / 416
			1.780	RRF 1.0 / 1040
			1.742	RRF 5.0 / 5200
			1.918	RRF 25 / 26000
			1.813	RRF 50 / 52000
			1.690	RRF 100 / 104000
Standard Deviation =	0.0789643			
Average RRF =	1.750	Laboratory AVG RRF =	1.750	
% RSD =	4.51	OK? Laboratory %RSD = OK?	Yes 4.51 Yes	

Initial and Continuing Calibration Worksheets - VOC

SDG Number: P1604080

	Continuing Ca	libration Curve Calculation	S	
Formula for Calculation of F	Relative Response I	Factors (RRF)		
Area _X	multiplied	Amount IS	= RRF	
Area _{IS}	by	Amount _X	•	
where:				
Area $_{X}$ = Area of the character Area $_{IS}$ = Area of the character Amount $_{IS}$ = Amount of International Amount $_{X}$ = Amount of composition	ristic ion for the refer al Standard added			
CCAL Filename: 08231601.D		Date/Time : 8/23/16 0330		
1,1-Dichloroethane	referenced to:	Bromochloromethane		
563948 160417		12.5 26	CCAL RRF=	1.690
		Laboratory	CCAL RRF =	1.690
Formula for Calculation of p	percent Difference ((%D)		
ICAL AVG RRF - CCAL RE	RF multiplied by	100	= %D	
Where: CAL AVG RRF = The averag CCAL RRF = The Relative Re	•	actor from the curve the continuing calibration veri	ification run daily	
			%D =	3.4
		Laboratory %D = OK?	3.4 Yes	

Sample Compound Concentrations - VOC

SDG Number: P1604080

Formula for Calculation of Concentrations		Air		
(Area _x) (Mass _{IS}) (Df)	=	Mass in pg		
(Area _{IS}) (RRF _X)	ı			
where:				
Area _X = Area of the characteristic ion for the compound	to be mea	sured		
Area _{IS} = Area of the characteristic ion for the reference	d Internal S	Standard		
Mass _{IS} = Mass of Internal Standard added (pg)				
$RRF_X = AveragevRRF$ of compound from initial calibrat $DF = Dilution Factor$	ion curve			
(Mass in pg)	=	Concentration in ng/L	=	Concentration in ug/m3
(Injection Volume in L) (1000)	1			
where: 1000 is conversion from pg to ng		A :		
Sample ID : P1604080-003		Air		
1 1004000 000		1,1,-Dichloroethane		
On-Column Mass =		89.47		
Area _x =		1955310		
Area _{IS} =		156106		
Mass _{IS}		12.5		
$RRF_X =$		1.690		
Conversion Factor = DF =		1 1.8		
D1 =		1.0		
	Lab Conc in	Calc Concentration in	Lab Mass in	
Compound(s)	ug/m3	ug/m3	pg	Calc Mass in pg
1,1,-Dichloroethane	160	167	NR	
Concentrations agree within 2% ?		Yes		

Comment: Differences due to rounding

NR: Not reported

Sample Compound Concentrations - VOC-#2

SDG Number: P1604080

P1604080-001
8/23/16 1257
Air
1,1,1-Trichloroethane
1,4-Difluorobenzene
71.434
1193787
593744
12.5
0.352
1.5
107
440
110
Yes

Comment: Difference due to rounding

Surrogate Recoveries - VOC

SDG Number: P1604080

% Recovery	= _	_x 100				
	Sample ID : P1604080-018					
	Surrogate	Amt/Conc found	Amount/Conc spiked	% Rec	Lab %REC	OK?
-			40.5	91	91	Yes
	Bromofluorobenzene	11.4	12.5	91	0.	
	Bromofluorobenzene 1,2-Dichloroethane-d4	11.4 13.80	12.5 12.5	110	110	Yes

LCS/LCSD Recoveries - VOC

SDG Number: P1604080

	% Recovery	=	Concentration or amour	nt found	x 100	
			Concentration or amoun	t spiked	_	
	LCS Sample ID: P160823-DLCS		LCS Sample ID:			
	Compound	Conc found	Conc spiked	% Rec	Lab %REC	OK?
CS #1	Vinyl Chloride	170	200	85	85	Yes
CSD #1	Vinyl Chloride	171	200	86	86	Yes
S #2	1,1,1-Trichloroethane	189	210	90	90	Yes
SD #2	1,1,1-Trichloroethane	193	210	92	92	Yes
S #3	Benzene	179	226	79	79	Yes
CSD #3	Benzene	182	000	0.4	0.4	
	Benzene	102	226	81	81	Yes
	Formula for Calculation of Relative Percent Differe	nce			81	Yes
			LCSR - LCSDR	_x 100	81	Yes
	Formula for Calculation of Relative Percent Differe	nce			81	Yes
	Formula for Calculation of Relative Percent Differe Relative Percent Difference	nce =	LCSR - LCSDR		81	Yes
	Formula for Calculation of Relative Percent Differe Relative Percent Difference where: LCSR = Laboratory Control Spike Recovery LCSDR = Laboratory Control Spike Duplicate Recover Compound(s)	nce =	LCSR - LCSDR			Yes
1	Formula for Calculation of Relative Percent Differe Relative Percent Difference where: LCSR = Laboratory Control Spike Recovery LCSDR = Laboratory Control Spike Duplicate Recover	nce =	LCSR - LCSDR (1/2) (LCSR + LCSDR)	_ x 100		Yes
1 2	Formula for Calculation of Relative Percent Differe Relative Percent Difference where: LCSR = Laboratory Control Spike Recovery LCSDR = Laboratory Control Spike Duplicate Recover Compound(s)	nce =	LCSR - LCSDR (1/2) (LCSR + LCSDR)	_x 100 _bab RPD	OK?	Yes

Duplicate Precision Recoveries - VOC

P1604080

SDG Number:

Formula for Calculation of Relative Percent Difference | MSR - MSDR | (1/2) (MSR + MSDR) Relative Percent Difference where: MSR = Matrix Spike Recovery MSDR = Matrix Spike Duplicate Recovery Sample ID: Compound NR **Duplicate** Sample Duplicate Concentration = Sample Concentration = Compound(s) RPD (Conc) Lab RPD OK?

Comment:

NR: Not reported